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# ENVIRONMENTAL ASSESSMENT BOARD



## ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARINGS

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VOLUME: 118

DATE: Wednesday, March 4, 1992

BEFORE:

HON. MR. JUSTICE E. SAUNDERS	Chairman
DR. G. CONNELL	Member
MS. G. PATTERSON	Member

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ENVIRONMENTAL ASSESSMENT BOARD  
ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARING

IN THE MATTER OF the Environmental Assessment Act,  
R.S.O. 1980, c. 140, as amended, and Regulations  
thereunder;

AND IN THE MATTER OF an undertaking by Ontario Hydro  
consisting of a program in respect of activities  
associated with meeting future electricity  
requirements in Ontario.

Held on the 5th Floor, 2200  
Yonge Street, Toronto, Ontario,  
on Wednesday, the 4th day of March,  
1992, commencing at 10:00 a.m.


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VOLUME 118  
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B E F O R E :

THE HON. MR. JUSTICE E. SAUNDERS	Chairman
DR. G. CONNELL	Member
MS. G. PATTERSON	Member

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1 ---Upon commencing at 10:03 a.m.

2 THE REGISTRAR: Come to order, please.

3 This hearing is now in session. Please be seated.

4 THE CHAIRMAN: Mr. Moran?

5 MR. MORAN: Good morning, Mr. Chairman.

6 I have about three or four more questions for Mr.

7 Shalaby and then Ms. MacDonald is going to take over  
8 from there.

9 Just before I begin, I would like to  
10 industry Mr. Andrew Barrett. He is from the Ministry  
11 of Energy and he is an advisor on gas and  
12 transportation for the Ministry.

13 WALTER RAYMOND EFFER,  
14 CHARLES WILLIAM DAWSON,  
15 JAMES RICHARD BURPEE,  
16 GARY NEIL MEEHAN,  
JOHN DOUGLAS SMITH,  
AMIR SHALABY; Resumed.

17 CROSS-EXAMINATION BY MR. MORAN (Cont'd):

18 Q. Good morning, Panel.

19 Mr. Shalaby, just a couple of questions  
20 left for you.

21 I would like to start off with the  
22 demand/supply planning strategy element from Exhibit  
23 74, that's 3.5.1, you will find that on the second page  
24 of the excerpts that I handed out yesterday.

25 MR. SHALABY: A. I have it.

1 Q. 3.5.1 and the two that follow that,  
2 which I am also about to refer to are caught up under  
3 the category of demand management.

4 Development and implementation of  
5 economic demand reduction programs should  
6 be started early enough to be effective  
7 in contributing to the most  
8 cost-effective demand/supply balance.  
9 Then if we move to 3.6.1:

10 Technical research and market  
11 development to support existing and  
12 planned demand management programs will  
13 be given a high priority so that demand  
14 options can be efficiently implemented in  
15 a timely manner.

16 And finally 3.6.2:

17 To provide flexibility, technical  
18 research and market demonstration  
19 programs should be undertaken to provide  
20 information on the potential for new  
21 demand management programs.

22 If we take those three elements and  
23 translate them so that we apply them to the alternative  
24 technology programs of Ontario Hydro, my question is:  
25 How do we ensure that those principles can be met if



1 Ontario Hydro is simply monitoring literature and  
2 following other jurisdictions and waiting for a  
3 breakthrough to happen? In other words, how can we  
4 ensure that breakthroughs can actually be brought into  
5 account in a timely fashion?

6 A. I think those principles have in  
7 them, if we read again in 3.5.1 that you just read, one  
8 of the key words there is development and  
9 implementation of economic demand reduction programs.  
10 It didn't say implementation of all and any demand  
11 management programs; only those that are economic. And  
12 I think the same would apply to alternative energy  
13 sources that we feel are economic at this stage.

14 If they are not economic, the strategy  
15 elements that apply would be different than those. It  
16 would be those that have to do with doing research,  
17 monitoring developments and being ready to take  
18 advantage when breakthroughs are established elsewhere.  
19 So I think you can't transport that in its entirety for  
20 the alternative energies.

21 Q. Exhibit 344 makes reference to the  
22 fact that photovoltaics, for example, have been  
23 becoming more economic at a rate of about 15 per cent  
24 per year over the last 10 years, quite a steady  
25 improvement.

1 A. Yes.

2 Q. And 344 also makes reference to the  
3 fact that wind energy technology is very close in fact  
4 to being economic in the Ontario context.

5 A. In good sites.

6 Q. Right. And the question I have is,  
7 that without an ongoing research program to support  
8 those technologies, how can we ensure that in fact  
9 those technologies can be incorporated in a  
10 cost-effective way and in a timely fashion to take full  
11 advantage of them in a way that seems to be suggested  
12 is a principle that you apply to demand management  
13 programs?

14 A. Well, I think in Panel 4, and I will  
15 explain a bit about demand management programs and how  
16 concepts are adopted and maybe then transport that to  
17 the alternative energy story, because these elements  
18 are written for demand management.

19 In demand management, as Panel 4  
20 explained in detail, there are a large number of  
21 concepts being examined continuously. There is in fact  
22 a committee that examines concepts for demand  
23 management and concepts are brought forward  
24 periodically, and when there is an agreement or  
25 consensus that a concept is promising, close to be

1 economic, is in the best interests of customers, then  
2 that takes the next step of being a candidate for  
3 development and for further examination and perhaps  
4 incentives and product development, and so on.

5 Something similar to that, perhaps not in  
6 the same rigor and the same idea of being in a  
7 committee and so on happens with alternative energies:  
8 Periodic examinations, and when something is close to  
9 being an economic proposal, then we take the next step  
10 and that is to think of implementation strategies, and  
11 to think of wider demonstration steps.

12 But at this stage some of the  
13 technologies that we have are so far away from being  
14 economic that the appropriate measure that we think now  
15 is research and some demonstration and monitoring.

16 We have a larger program in the fuel  
17 cells, there is a large fuel cell task force within  
18 Hydro and they have a larger amount of money than other  
19 alternatives, they have several million dollars in  
20 their program over the two or three years to spend on  
21 understanding and demonstrating and purchasing various  
22 fuel cells for actual implementation.

23 So, I think the more we appreciate that a  
24 technology is becoming close to being economic or has a  
25 promise of being economic, the more interest and

1 spending will take place.

2 THE CHAIRMAN: Excuse me, your evidence  
3 in the last few days has been that you spend, I think,  
4 half a million dollars in research and development for  
5 alternative energies.

6 MR. SHALABY: Yes.

7 THE CHAIRMAN: But I take it then that  
8 this fuel cell task force is separate from that.

9 MR. SHALABY: The task force, I think the  
10 budgets is outside of research, I think it is the  
11 budget of the design and development division. I am  
12 not exactly sure of that, but I think it is partly  
13 design and development and partly the NUG division.  
14 The NUG division has a considerable amount of money to  
15 spend on renewable energies as well.

16 Whether it's being approved in the budget  
17 or not I don't know, but the budget submission this  
18 year had several million dollars in the NUG division  
19 for renewable energy demonstrations and programming,  
20 and it was in part a response to the new energy  
21 directions, I think, or some other government  
22 initiative, I forget which one it was, on redoubling  
23 the efforts on the NUG area, I think.

24 THE CHAIRMAN: Are there any other  
25 initiatives relating to alternative energy similar to



1 the fuel cell task force that are outside the normal  
2 R&D operation?

3 MR. SHALABY: I think there is also one  
4 that Mr. Dawson mentioned, and that is recovery of low  
5 grade heat at Pickering, a joint venture with Alcan to  
6 find ways of recovering the low grade heat that is  
7 discharged into the lake by simple heat exchangers,  
8 aluminum heat exchangers that are put close to the  
9 condenser. That is also something that the Minister of  
10 Energy announced over the last month or two I think.

11 So, that is another program, and I think  
12 much of that money is spread throughout the company.  
13 The budgeting and allocation of the money within the  
14 company is a fairly complex procedure. But there are  
15 pockets of money, one of them is the fuel cell and the  
16 other one is the low grade heat. But the research  
17 division has the half a million dollars that I  
18 mentioned before.

19 All I want to bring to your attention is  
20 the idea that when opportunities present themselves,  
21 there is effort that is mounted to explore the  
22 opportunity.

23 MR. MORAN: Q. Underlying all of that  
24 though is the principle that someone else has to  
25 present them other than Ontario Hydro; right?

1                   MR. SHALABY: A. No, many of those  
2 opportunities have a lot of Hydro effort to ignite them  
3 and spark them and get the action together.

4                   We have a lot of people that are keen to  
5 see these developments take place and to see the  
6 research go on and the demonstration go on.

7                   Again, Hydro is not a singular entity.  
8 There are people in Hydro that have a lot of fire in  
9 them to get so some of these technologies going and  
10 others that have responsibility for budget allocations  
11 that have to say no to certain things.

12                  So again we are simplifying things when  
13 we say that Hydro should or shouldn't. Hydro is 30,000  
14 people and within it there are a lot of different  
15 motivations and different initiatives.

16                  Q. The two to three people out of those  
17 30,000 people that are involved in wind and solar  
18 research, they are basically just following the  
19 literature and waiting for something to elsewhere.

20                  Ontario Hydro is not driving this itself,  
21 is it?

22 [10:13 a.m.]

23                  A. Well, I think we don't want to  
24 shortchange the effort they make. They contribute to  
25 demonstrations. They designed and built the largest

1 photovoltaic facility in Canada. They are contributing  
2 to an even larger facility at Sunnybrook. They help  
3 our customers by distributing information. And as I  
4 said yesterday, almost 10,000 of these brochures have  
5 been distributed over the last couple of years.

6 So I think they do more than follow the  
7 literature. I think to describe it just as following  
8 the literature is short-selling them a bit.

9 Q. We look at Exhibit 74 --

10 A. They accompany the Board in the  
11 Kortright Centre, for example, in some of the things  
12 that they do.

13 Q. If we look at Exhibit 74, the general  
14 strategic principle 1.4, it reads:

15 Ontario Hydro will take a leadership  
16 role in protecting the environment and  
17 Ontario Hydro will encourage the social  
18 benefits associated with its activities.

19 Again, just focusing in on the wind and  
20 solar programs which appear to be following what is  
21 happening elsewhere as opposed to actually doing active  
22 research, how do you fit that approach to this  
23 principle?

24 A. You are asking a linkage between  
25 research and development or effort and renewables --

1 Q. The actual activities Ontario Hydro  
2 is now engaging in with respect to solar and wind  
3 technologies, how does that fit into that principle?

4 A. I think the money we spend on  
5 renewables and alternative technologies is in part  
6 driven by their favourable environment impact in  
7 certain areas. That is one way the money we spend fits  
8 with this area.

9 I suspect, though, your question is  
10 saying that one should spend more if that principle is  
11 really dominant. Is that where you are coming from?

12 Q. I am suggesting that perhaps there is  
13 a greater leadership role for Ontario Hydro to play in  
14 this area than it is presently playing perhaps if it is  
15 playing one at all.

16 A. Perhaps there is. I think we have  
17 obligations to our customers to balance what we do with  
18 rates, expenditures on various projects, wise  
19 investments of research dollars, allocation of those  
20 amongst various priorities.

21 I think the superficial comparison that  
22 everybody keeps making with you spend so much on solar  
23 and you spend a lot more on nuclear is really a very  
24 superficial comparison.

25 The money we spend on nuclear is spent on

1 operating half of our energy production. We get fully  
2 half of our energy from nuclear facility. And the  
3 research money is on the metallurgy of some of the  
4 problems we have at the operating stations.

5 We are not doing research on developing  
6 new concepts in nuclear energy. The research we are  
7 doing is to do with understanding operating problems  
8 and resolving operating problems.

9 So, the question isn't as simple as  
10 figures thrown out as you spend 20 times as much on  
11 this as that to get the level of commitment. It is a  
12 question of balance and I will accept your premise that  
13 perhaps some people expect us to do more on  
14 alternatives. Others, to be frank, expect us to do  
15 less. There are views that say, well, why not leave  
16 that to the manufacturers and people who make money out  
17 of these technologies?

18 There are big multi-national companies.  
19 It is a very big league game this alternative energy  
20 business and people are going to make a lot of money  
21 out of these technologies and some people urge us to  
22 let the marketplace take care of itself and when the  
23 products are available, we will use them. So we are  
24 going somewhere in between.

25 Q. You will agree that Ontario Hydro has



1       spent considerable money in the past on modifying  
2       nuclear technology in order to improve it; right?

3                   A.   Yes.

4                   Q.   And you will agree that the same kind  
5       of thing is not happening with photovoltaics and wind  
6       turbines. Ontario Hydro is not spending money on  
7       trying to improve the technology right now.

8                   A.   Not to the same extent that we spent  
9       on technology that we saw as supplying half or more of  
10      our energy. I think when we become convinced that  
11      solar and wind will supply a significant amount of our  
12      energy and electricity and we are being close to being  
13      commercial, close to being economic, that would be a  
14      time when Hydro will step in and improve the technology  
15      and adapt it to its own conditions.

16                  Q.   And your evidence yesterday was that,  
17      at least, in the wind area, we are close to being  
18      economic, right?

19                  A.   Provided we find good sites, yes.  
20      And the question of who should find the good sites and  
21      who should characterize the good sites is an unanswered  
22      question.

23                  I am sure you are aware, Mr. Moran, as  
24      well that the government is investigating these  
25      questions, that they have an alternative energy council



1 that Ontario Hydro sits on that has both the industry,  
2 the policy makers and the utility. And they are  
3 conducting studies to see what could be commercially  
4 viable in the year 2005.

5 They have commissioned studies by  
6 Hickling Consultants, for example, that is screening  
7 what the technologies that could be suitable for  
8 Ontario and their report is forthcoming. The Phase 2  
9 of their report will be forthcoming to tell us what the  
10 government view will be on the potential for  
11 commercialization on a larger scale. So we will be  
12 awaiting those results.

13 MR. MORAN: Thank you, Mr. Shalaby.  
14 Those are my questions, Mr. Chairman. I am going to  
15 turn it over to Ms. MacDonald now.

16 THE CHAIRMAN: Okay.

17 MS. MacDONALD: Good morning, Board.  
18 Good morning, panel. I would begin this morning with  
19 some health issues. I am aware that the health issue  
20 was the subject of a very rigorous cross-examination by  
21 Mr. Campbell as well as Mr. Starkman; Mr. Campbell, of  
22 course, Counsel for the Ontario Public Health  
23 Association and Mr. Starkman for the CEG. And I will  
24 try not to get into areas of repetition, but we just  
25 wanted to follow through on a number of areas and the

1 questions will involve Dr. Effer and Mr. Shalaby  
2 initially.

3 CROSS-EXAMINATION BY MS. MacDONALD:

4 Q. I wonder, Doctor Effer, if you could  
5 assist us just with first three points of clarification  
6 on some technical matters and we are going to refer you  
7 to your Exhibit 468, the Ontario Hydro materials on  
8 environmental and health factors. If I could direct  
9 you first to page 93 of Exhibit 468 and your figure  
10 6.5.

11 DR. EFFER: A. Yes, I have it.

12 Q. All right. This particular chart, as  
13 you will recall, Mr. Campbell cross-examined on a  
14 number of issues, but the clarification we are seeking  
15 is, in that particular chart, the choice of  
16 particulates is in there, but we are wondering, the  
17 trace organic species, are they the only recognized  
18 products of the combustion of coal? And our concern  
19 is, could there not be other products included? For  
20 example, benzo(a)pyrene is only one of a whole family  
21 of polyaromatic hydrocarbons.

22 So our question simply I guess is: Could  
23 there be more additional trace organic species put into  
24 the list?

25 A. Yes, there could be an extensive

1 number of other organic compounds which there in even  
2 more minute levels, yes.

3 Q. Dr. Effer, could you assist us just  
4 with why these particular trace organics were in the  
5 list and others were not included?

6 A. I believe these were included because  
7 these are compounds or elements which are included in  
8 your list of substances under the Clean Air Program,  
9 controlled substances.

10 Q. All right. Thank you. We are  
11 going to take you now to figure 6.2 and I believe that  
12 is on page 89, and again, just two points of  
13 clarification.

14 A. Yes, I have it.

15 Q. Yes. All right. We wonder if you  
16 could assist us with how the annual maximum  
17 concentration in that chart is defined, if you could  
18 just assist us with that.

19 A. This is arrived at by taking the  
20 emission factors which have been developed by -- or  
21 emission rates rather that have been developed by  
22 actual analysis of power plant effluents and then  
23 applying there the long-term model, which is a Ministry  
24 of the Environment model, and carrying out the  
25 modelling procedure and arriving at the annual levels.

1 [10:25 a.m.]

2 Q. Concentration?

3 A. The multi-source modelling, yes.

4 Q. Okay.

5 THE CHAIRMAN: It would help me if you  
6 both either got the microphone closer to you or spoke  
7 up.

8 ---Off the record discussion.

9 MS. MacDONALD: Q. Again, just one other  
10 technical matter in that same chart, Dr. Effer. We are  
11 just looking at the unit risk factors in that chart,  
12 and could you tell us, those unit risk factors, are  
13 they the current factors in present use now or is there  
14 any kind of date on those factors as they appear in  
15 your materials?

16 DR. EFFER: A. These were taken from two  
17 sources. I think the reference is given. The  
18 California Air Pollution Control -- no, I may have got  
19 the name wrong.

20 CAP. The reference is given at the  
21 bottom of the table, that reference is at label 1991.  
22 That is one of the sources. The other one is the U.S.  
23 EPA, and we haven't got a date attached to that  
24 reference, but I believe it's very recent.

25 Q. Thank you. We are interested in the

1 currency of those risk factors. Those are just the  
2 only technical questions --

3 A. I don't believe that we have had  
4 reason to believe that there are different numbers  
5 attached to those risk factors since that data has been  
6 referenced.

7 Q. Thank you, Doctor.

8 This I think again will be Dr. Effer,  
9 possibly later Mr. Shalaby. Again, following up on an  
10 area of cross-examination from Mr. Campbell.

11 If I could direct you, the issue or the  
12 matter we are concerned with is, Mr. Campbell, his  
13 cross-examination in the area of the material in your  
14 Exhibit 468, whether it demonstrated information on the  
15 characteristics of the population. So I will direct  
16 you first to the part of the transcript, we will begin  
17 there.

18 If you go to Volume 112, and pages 19664  
19 and 19665. Just to put it in context, Dr. Effer, at  
20 this point you and Mr. Campbell had been looking at  
21 your exhibit at page 45 and your list of the five  
22 fundamental components of health effects, and perhaps  
23 we will just begin in the middle of 19664 where Mr.  
24 Campbell initially begins the question indicating when  
25 you do look at your list of the five fundamental



1 components of health effects:

2 I wonder if you would also add to  
3 those five the number of people exposed  
4 to contaminants, the numbers of people  
5 who are particularly vulnerable such as  
6 those who may be elderly, or the very  
7 young or the unborn child, and so on.

8 Following up he asked:

9 "Would that also be a component which  
10 one would want to take into account in  
11 assessing health effects?"

12 And your answer at line 24:

13 "Yes, we were being general here. I  
14 think that those additions that you  
15 suggested are contained" - and here I  
16 believe you go into page 45 - "in 3" -  
17 that category - "the exposure of humans  
18 to pollutants. I think there we have  
19 implied the different humans gets  
20 different exposures and, of course, that  
21 also includes populations."

22 We will have one short question here  
23 before we go on. Your evidence Dr. Effer, then is that  
24 you have to imply that into your chart, that there is  
25 no direct evidence or summary of the population

1 profile, if I can call it that, in terms of elderly or  
2 frail population factors?

3 A. We didn't include that in our study.  
4 We just took gross population densities, yes.

5 Q. Now, if I could ask you just at this  
6 point, Dr. Effer, why did you not contain that kind of  
7 information in your study?

8 A. The limitations of this study are  
9 such that that amount of detail hasn't been included.  
10 I think with respect to the long-term effects, the  
11 annual effects which we have come up with, possibly  
12 that might not be of such great value seeing that we  
13 are integrating over a life time. And with people  
14 moving in and out of the area during that period, I  
15 think it becomes possibly progressively less valuable  
16 to go into that level of detail.

17 Admittedly, there will be some value in  
18 taking profiles of people within the receptor areas,  
19 but within the limits of this present study, that  
20 hasn't been considered.

21 Q. Would you agree, Dr. Effer, that if  
22 you consider a population profile in Canada or in  
23 Ontario generally, we are dealing with what some health  
24 people have called an aging population, a population  
25 profile that would bring in the age factor and might in



1 fact be a valuable component of your health list?

2 A. Yes, in some case that might be the  
3 case. Although there has been work done which suggests  
4 that inclusion of an aged sector of the population  
5 might be misleading. In some areas there are what is  
6 being called hardy survivors which probably tend to  
7 skew the results.

8 Q. But except for that, the general  
9 application of the aging population, that it would be a  
10 valuable factor, would you agree?

11 A. Yes, the most detail we go into the  
12 on the segments of the population being at the receptor  
13 points would give additional information. The  
14 incremental value in a mathematical way, as our  
15 treatment has been, might be in doubt.

16 Q. Our interest there, Dr. Effer, is  
17 that when you consider that some of the effects of  
18 fossil emissions in fact do result in respiratory  
19 difficulties for individuals, that the profile of the  
20 population in terms of age or vulnerability, for  
21 example, people suffering from asthma, that it does  
22 become an important component?

23 A. Yes, I am very much aware of that.

24 Q. Just a second point while we are on  
25 that very same page, Dr. Effer, dealing now with a

1 different issue again raised initially by Mr. Campbell  
2 and it's the monitoring aspect, monitoring population.  
3 In the middle of that page, 19665, Mr. Campbell asked  
4 you concerning the factors that you have just spoken  
5 of:

6 "Would that also include the  
7 monitoring of population trends in shifts  
8 over time?"

9 And your answer was:

10 "We have not gone into that level of  
11 detail in this study. We have assumed a  
12 stable -- for this study, we have assumed  
13 a stable population. I took one specific  
14 point in time."

15 And our question is: Would it not be  
16 valuable to have some aspect of monitoring and the  
17 health impact data that's in the environmental study  
18 and health this study? So this monitoring factor,  
19 would you not agree it would be a useful factor to work  
20 in?

21 A. I assume you mean a ground level  
22 verification of -- when do you say monitoring, I'm not  
23 sure what you mean. Monitoring of actual health  
24 effects or monitoring of movements of population?

25 Q. Well, Mr. Campbell, was speaking of

1 monitoring of population trends and shifts over time,  
2 so that we can deal with that aspect first. And then  
3 we are also thinking of monitoring over time, if you  
4 consider that your information, it might be like a  
5 snapshot of a particular community at a particular  
6 time, but would there not be some merit in monitoring  
7 the progress of that community over a certain time  
8 period?

9 A. It's true that we are not taking into  
10 account the movements of people in and out of those  
11 sectors in the area. It would add additional  
12 information and would refine the method, yes.

13 I think one thing we should mention here  
14 is that we are assuming that the receptor individual or  
15 population is actually in the area for a period of 70  
16 years, and that probably isn't quite the case in actual  
17 practice.

18 We are also making another conservative  
19 assumption that that population is outdoors all the  
20 time receiving that maximum ground level concentration,  
21 and I think I did detail many of the other conservative  
22 factors which we have built into this current  
23 assessment.

24 Q. All right. If I could just ask you  
25 one additional question then. I believe it comes

1 around this part of the transcript, again I think it is  
2 still connected to monitoring. Mr. Campbell was asking  
3 about your baseline and you indicated that you used a  
4 baseline study of one year and we were interested in  
5 that. Is that the case, I think you did advise Mr.  
6 Campbell that you used a one year baseline for your  
7 study?

8 A. I think that was in reference to the  
9 actual meteorological data that we used for calculation  
10 of the dispersion characteristics of the discharge from  
11 the plant. That was the reference of the one year  
12 baseline.

13 We integrate all of the winds, wind  
14 directions and speeds, and stabilities and apply that  
15 over the whole year.

16 Q. We just had a question on the length  
17 of the base year, that is one year, but Mr. Campbell  
18 indicated if you are looking at a potential 25-year  
19 study, why was it that you chose a one year baseline?

20 A. Lambton is probably the station where  
21 we have the most detailed air pollution data of this  
22 kind. I believe we do have additional years, and I'm  
23 not entirely sure what the year-to-year variation  
24 actually is.

25 Again, using an extended number of years

1 as a baseline, would refine the method, yes.

2 Q. Thank you, Doctor.

3 Another small question in kind of a  
4 related area. Again, going back just briefly to the  
5 population profile. We have reviewed the Exhibit 468  
6 and we have noticed that the human health effects on  
7 the population living around the generating station are  
8 estimated, and that's clear that that evidence is in  
9 your materials, but the effects on, for example, the  
10 staff of the generating station are not included and we  
11 wondered if you might agree that that information would  
12 be beneficial to bring that into the study, details  
13 like that, the actual staff?

14 A. You are thinking of occupational  
15 health exposures, that is when they are not at the  
16 receiving end of the emissions but are actually in the  
17 plants.

18 Q. In the working environment.

19 A. I think that that is a whole  
20 different area of study and there are occupational  
21 health monitoring methods in place that, but I don't  
22 think that that would add a great deal of value to this  
23 current study.

24 Q. Would that type of information be  
25 then available in those other studies, Dr. Effer, an



1 occupational and health this study then?

2 A. I don't believe they are in relation  
3 to exposure to sulphur dioxide or nitrogen oxides or  
4 particulate. Actually the plant itself is in an area  
5 of very low concentrations and it certainly would be  
6 typical area.

7 Q. Thank you. And again this is one  
8 isolated question just to clarify something.

9 I will bring you to, I believe, the same  
10 volume, page 19666.

11 [10:38 a.m.]

12 A. Yes, I have it.

13 Q. Yes. At this particular part of the  
14 cross-examination, Mr. Campbell was questioning you on  
15 the difference, the regional scale versus the local  
16 scale study. And maybe to begin with his question at  
17 line 7:

18 "Is there any particular reason for  
19 the choice of area to be covered in this  
20 study;" and then he mentions the regional  
21 scale example.

22 And your answer:

23 "I am not aware of the reason for the  
24 larger area done in the regional scale.

25 However, in the local scale one, we tend

1 to believe that the smaller scale --  
2 beyond that area, the health risks fall  
3 off extremely rapidly and don't add  
4 materially to the assessment."

5 And we are interested in what basis there  
6 is for your statement that the effects tend to fall off  
7 extremely rapidly.

8 A. When we apply the multi-source model  
9 and notice the concentrations - I think we have the  
10 graphs in the report - the concentrations do fall off  
11 quite rapidly beyond the distance that we have confined  
12 ourselves to in the small scale model.

13 When we integrate beyond the area that we  
14 have chosen here the exposure is relatively small and  
15 summation of those exposures beyond that distance do  
16 not really add greatly to the total population dose.  
17 That is on an annual basis.

18 Q. All right. And again, this is just  
19 one issue but we wanted clarification on it. We will  
20 bring you now to Volume 112, page 19657.

21 A. Yes, I have it.

22 Q. All right. Just to recall this  
23 particular part of the evidence, you will recall that  
24 Mr. Campbell at this point was questioning you with  
25 respect to marginal values of the assessment and maybe



1 it would be to easier if I could begin over on the  
2 previous page. The area that he was exploring with you  
3 was your evidence and your charts on trace element  
4 emissions and trace organic estimates. So he was  
5 beginning to get into those areas.

6 Over on page 19656 at line 16, perhaps it  
7 would be more helpful if I begin with his question. He  
8 begins to question you on trace element emission  
9 estimates listed in your 468 exhibit and trace organic  
10 estimates.

11 And he asked:

12 Could they be related to several  
13 plants that you have in operation?

14 And you answered:

15 They could be "to some degree. They  
16 would be slightly different again  
17 depending on the type of fuel that is  
18 burned."

19 Then he asked:

20 "Would this be a useful exercise for  
21 the purpose of assessing health impacts?"

22 Your answer:

23 "There are measurable differences in  
24 trace elements between coals, and for the  
25 purpose, for this exercise, I think the

1 benefit will be marginal."

2 He then asks:

3 We could look at emissions which are  
4 emitted at a particular plant and compare  
5 it to emissions elsewhere and one could  
6 look at the populations around those  
7 plants and get a better projection.

8 And you agreed with him:

9 "Yes, you would get a more detailed  
10 assessment."

11 This is the area we are interested in.

12 He asked:

13 "But you say that would be of marginal  
14 value. Can you tell me why you think  
15 that would be of marginal value?"

16 And your answer:

17 "Well, I am saying that if we come to  
18 the end product and look at the final  
19 result that we have of trace element  
20 effects on health, I think we could  
21 accommodate fairly substantial  
22 differences between plants and - again, I  
23 am guessing here - not arrive at too much  
24 of a difference in the final health risk  
25 assessment."

1 And his question:

2 "You say guess, you mean an educated  
3 guess?"

4 And our question is: On what was that  
5 educated guess based?

6 A. There are two things here: One is  
7 the composition of the coals influencing the trace  
8 elements; and then the other is the population  
9 distribution around the plant. We chose Lambton  
10 because it has got quite a fairly dense population in  
11 and around the area. Certainly we feel as though the  
12 population distribution would influence the results  
13 mostly for population exposure.

14 For example, at Nanticoke, I think that  
15 the results would be much lower because of the low  
16 population densities. At Lakeview they may be somewhat  
17 the same or possibly higher than at Lambton.

18 Again, I think that the obvious thing to  
19 do would be to do a specific analysis at each plant.  
20 We are not claiming here that this is a result which  
21 should be applied to other situations without question.  
22 We are just saying, this is a model which we have tried  
23 out in the Lambton area and we have chosen that because  
24 we have good meteorological data. That was one of the  
25 reasons we chose it. But we could do this at other

1 plants and get different results, but we are simply  
2 demonstrating a method here at arriving at an estimate.

3 Q. All right. Would you agree, Dr.  
4 Effer, that that type of analysis, looking at the  
5 different plants and the emissions and the health  
6 impacts, that that would be a valuable exercise to  
7 analyse the differences in plant emissions and impacts?

8 A. I think there are a fair number of  
9 opportunities to go beyond this existing study. We  
10 could expand into several areas such as at different  
11 sites and also go into more -- as you have mentioned  
12 before, extend the base period for getting refined data  
13 feeding into the assessment. Yes, there are a lot of  
14 opportunity here. If this method is accepted as a  
15 reasonable one for assessing health effects, then there  
16 may be some value in extending it.

17 Q. I will go to another issue, Dr.  
18 Effer, and it may involve eventually Mr. Shalaby just  
19 because he joined in the discussion on this particular  
20 issue and it dealt with the quantification of health  
21 costs. And just to refresh your memory, as you will  
22 recall, both Mr. Campbell and Mr. Starkman did spend a  
23 considerable amount of time on that issue, so we are  
24 not going to repeat that but just follow through on a  
25 number of things.

1                   If I could bring you back into some of  
2           the discussion by going to Volume 113 and that is Mr.  
3           Starkman cross-examining on page 19723. And this  
4           particular passage saves a bit of time because Mr.  
5           Starkman encapsulates some evidence that Mr. Campbell  
6           received as well, so I will direct you to line 16, and  
7           Mr. Starkman indicates:

8                   "All right. Dr. Effer, you agreed  
9           with Mr. Campbell that it would be  
10          possible to quantify the cost, if you  
11          like, of hospital admissions, doctors  
12          visits, and so forth or, at least  
13          hospital admissions and doctors visits, I  
14          mean. Has Ontario Hydro quantified those  
15          costs?"

16                  Answer:

17                  "Well, for one of our studies that was  
18          submitted or one report that was  
19          submitted for the National Energy Board  
20          license we did relate emissions to the  
21          effects being increased hospital  
22          admissions and related that, and we did  
23          have a cost attached to that, which is  
24          what was required by virtue of the  
25          application to the National Energy



1 Board."

2 And you may recall there was a very  
3 lengthy discussion in which Mr. Starkman brought you to  
4 his own exhibit, which was Exhibit 486, which as you  
5 may recall, was an excerpt from the National Energy  
6 Board report, I believe chapter 4 at page 7. And he  
7 brought you briefly into that, that analysis.

8 And if you will recall that, we will then  
9 go to 19743 just to continue the discussion. And we  
10 will direct you to line 13 of that page. Again, Mr.  
11 Starkman indicating:

12 "Dr. Effer, is there some reason why  
13 the type of analysis that was carried out  
14 for the NEB filing that we have been  
15 looking at here, at least in the  
16 Executive Summary, was not done for this  
17 hearing or was not done for the existing  
18 system?"

19 And at this point, Mr. Shalaby assists  
20 and indicates:

21 "I think we discuss that in Panel 3 to  
22 some extent. The reason we did it for  
23 the NEB was a requirement of the NEB for  
24 an export license."

25 And Mr. Starkman questioned again:



1 "No, I am aware of that. So is the  
2 whole answer, it was a requirement of the  
3 NEB but you didn't feel that it was a  
4 requirement for this hearing? Is that  
5 the answer?"

6 And Mr. Shalaby indicates:

7 "Well, the studies have a lot of  
8 limitations, a lot of approximations made  
9 into them, and those were the reasons we  
10 discussed in Panel 3, to my  
11 recollection."

12 And Mr. Starkman pursues that and asked:

13 "But I take it with that answer, it  
14 would be possible for you to carry out  
15 such a study for the existing system?"

16 And your answer Mr. Starkman was:

17 "The answer is probably "yes", it  
18 could be done. What we carried out in  
19 Volume 4 or Exhibit 4 is a lot of  
20 discussion of health effects and  
21 environmental effects, not quantified to  
22 the extent but displayed all the  
23 emissions and all the impacts."

24 Again, Mr. Starkman asked:

25 "But I guess my specific question was,

1                   it would be possible - I take it the  
2                   answer would be "yes" - to monetize and  
3                   make an effort at monetizing the costs of  
4                   the emissions for the existing system, if  
5                   you wanted to?"

6                   And your answer:

7                   "Provided it has a lot of  
8                   limitations."

9                   And Mr. Starkman indicated: "Yes."

10                  So, just looking at that whole discussion  
11                  which began with Dr. Effer and ended with you, Mr.  
12                  Shalaby.

13                  I now just want to bring you briefly to  
14                  Exhibit 74 that my colleague Mr. Moran has referred to  
15                  yesterday with the alternative energy. That is the  
16                  excerpt from the DSPS and the general strategic  
17                  principles and I just wanted to direct both you and Dr.  
18                  Effer to one particular part of it. You will recall it  
19                  is the excerpt that you have been provided with.

20                  And Mr. Moran reviewed yesterday the  
21                  primary criteria for evaluating and developing  
22                  recommended plans and a secondary criteria. And I  
23                  wanted to focus in on the secondary criteria which  
24                  lists among it public safety concerns and social  
25                  considerations. And there is a strategic point there

1 that in developing plans, the secondary criteria will  
2 be quantified to the degree practical.

3 I wondered if you could indicate for this  
4 hearing, in terms of quantification of health costs,  
5 why that particular principle of quantification was not  
6 pursued.

7 MR. SHALABY: A. I get a feeling we are  
8 going over an issue for sort of fourth round or fifth  
9 round. You know, we discussed it in Panel 3. We  
10 discussed it with Mr. Starkman and you want further  
11 elaboration and the risk of contradicting what we did  
12 before is increasing as we go deeper and deeper into  
13 repeating the subject again and again.

14 My instinct is to say we have said  
15 everything there is to say about quantifying social and  
16 environmental costs. I don't know what else one can  
17 say in addition to the hours and hours we discussed in  
18 Panel 3 and the hours and hours we discussed during  
19 other panels, saying all of this.

20 Again, to directly answer your question,  
21 we didn't expect that the quantification is practical.  
22 I think the sentence here read is: The secondary  
23 criteria will be quantified to the degree practical.  
24 We did not feel that quantification of those costs is  
25 practical--

1 Q. That is what we --

2 A. --in the sense of, we didn't think it  
3 will add significant utility to decision-making; that  
4 quantification would not help us in decision-making.

5 Q. That is the point we were interested  
6 in, Mr. Shalaby, exactly why the decision was made that  
7 that quantification was not practical.

8 [10:55 a.m.]

9 A. The data is not there and the  
10 methodology is not developed.

11 The phenomena that we are trying to  
12 understand and quantify are fairly complex, is what Dr.  
13 Effer indicated. Very, very complicated to understand  
14 what exactly are the emissions from Lakeview doing to  
15 an asthmatic in Don Mills. It really is a very, very  
16 complicated study in epidemiology and other things.

17 So I am just saying that we have very  
18 superficial understanding of effects and very wide  
19 assumptions that we make for various studies, and we  
20 didn't expect that that study would help us,  
21 quantification would not help us.

22 Q. I will try to be very clear then.

23 DR. CONNELL: Excuse me, could I just  
24 intrude for a moment?

25 MS. MacDONALD: Yes.

1 DR. CONNELL: In Panel 3 we distinguished  
2 between quantification and monetization. There are  
3 many externalities which are quantified but not  
4 monetized in Hydro's approach.

5 I think it would be useful to use  
6 consistent terminology, and I think what you are  
7 discussing now is really monetization.

8 MR. SHALABY: Is monetization, which was  
9 the discussion Mr. Starkman was getting to, is why not  
10 doing something similar to the NEB which is monetizing.  
11 My answer to him said that we went the distance of  
12 quantifying tonnage and litres and so on, those are  
13 quantification of impacts, but putting the dollar sign  
14 on it is where we stopped.

15 MS. MacDONALD: Q. That's what we are  
16 interested in. That aspect would be the monetizing.

17 MR. SHALABY: A. Yes.

18 Q. And you will recall the evidence  
19 brought from Mr. Campbell's cross-examination that  
20 health impacts could be monetized. He reviewed I think  
21 initially with Dr. Effer that health impacts are  
22 capable of being monetized, put into dollar figures  
23 with hospital visits. So if you look at that, that's  
24 what we are interested in, why Hydro made the  
25 distinction of wanting to quantify the effects, but not



1       wanting to monetize the health impacts. That sort of  
2       question.

3                   A. I think that line of  
4       cross-examination, as I recall it, also suggested that  
5       there are many other costs in addition to just hospital  
6       visits, people who get irritated but don't go to  
7       hospitals.

8                   I think the limitations of that  
9       methodology were brought out in the cross-examination  
10      as well.

11                  Q. But it's my recollection, subject to  
12      everyone's review of the transcript, that Mr. Campbell  
13      was able to establish quite clearly that those health  
14      impacts were capable of being monetized. Do you agree  
15      with that?

16                  A. Yes, the costs of a hospital visit or  
17      a day absence from work is easily quantified.

18                  What is difficult, and what Dr. Effer has  
19      in his exhibit and has been attempting to deliver to  
20      this panel, is the linkages between a particular  
21      pollutant and a particular effect and a particular  
22      illness is a very complex relationship and is not well  
23      understood.

24                  Q. But the analysis was done for the  
25      National Energy Board and we are asking why the



1 analysis wasn't --

2 A. With all the caveats and all the  
3 limitations.

4 Q. Yes, but still the analysis was done.

5 A. Yes.

6 Q. The monetizing was done, and we were  
7 interested in why Hydro decided against doing it for  
8 the health study for the DSP.

9 A. We thought it's more powerful to  
10 quantify, to the extent we can, to explain the effects  
11 of those quantities in physical terms, and leave the  
12 decision maker with this: If you go this route, that's  
13 the kind of impact you will have, quantities you will  
14 have, and what those quantities do to health and safety  
15 and everything else, rather than roll everything in a  
16 dollar amount. Because when you roll it all in a  
17 dollar amount, you can conceal a lots of effects, you  
18 can mask a lot of other factors by rolling it all in  
19 one dollar amount. The decision-making then is made at  
20 the level of the analyst who is assigning dollar values  
21 to different impacts, not at the level of policy  
22 making.

23 DR. EFFER: A. May I just add that I  
24 think Mr. Snelson's offering in Panel 3 was a very  
25 clear and comprehensive discussion of all the factors

1 which we have just been discussing.

2 Q. Thank you, Dr. Effer. Perhaps we  
3 will leave that issue right there.

4 I just have one last area on the health  
5 issue. Again, I am trying to focus in on this area  
6 without being repetitive, but we want to just follow  
7 through on another area again brought out in  
8 cross-examination.

9 If I could summarize, I will give you the  
10 transcript references, but just to save some time, and  
11 I believe it was Mr. Campbell and Mr. Starkman in their  
12 cross, through their cross-examination of you, Dr.  
13 Effer, it was acknowledged by you that the particular  
14 information on health effects was focused on cancers in  
15 the 468 exhibit, rather than non-carcinogens, and I  
16 know that Mr. Campbell pursued that. But we were  
17 interested in that, the particular focus of your 468,  
18 why there was that distinction made between detailing  
19 the effects, cancer results of the emissions but not  
20 indicating the non-carcinogenic effects. I know you  
21 mentioned respiratory ailments, but would you agree the  
22 focus was primarily on cancers in your study?

23 A. I believe the reason for this was  
24 that the unit risk factors that we used as the basis  
25 for our calculations were those based on

1 predispositions to cancer.

2 Q. We were interested then why you did  
3 not have a comparable risk characterization for  
4 non-cancers in your report?

5 A. I'm not aware that such data has been  
6 developed in the same degree as for the carcinogenic  
7 potential of elements and compounds.

8 Q. But would you agree, Dr. Effer, that  
9 there would be related health costs all the same in  
10 this particular area?

11 A. Yes.

12 Q. And that that information would be  
13 useful to have in a health impact study?

14 A. It would add to it, yes.

15 Q. Thank you, very much, Dr. Effer and  
16 Mr. Shalaby. Those are the particular health issues  
17 we wanted to touch base with. We are going to move now  
18 into a fossil fuel area which will involve, I think,  
19 Mr. Smith and Mr. Meehan initially. We will move to  
20 another area.

21 If you will just bear with me, I will  
22 just find my materials here.

23 I will begin the discussion with a  
24 general kind of area of cross-examination dealing with  
25 Ontario Hydro's approaches or attitudes towards the use

1 of natural gas. Just as background to that we were  
2 going to draw your attention to what could be seen as a  
3 change in Hydro's position with respect to natural gas  
4 in Exhibit 3 at page 14-11, Ontario Hydro expressed the  
5 view in its original DSP that the long-term outlook for  
6 natural gas was uncertain. This is kind of a general  
7 summary of what is on that page.

8 We were then going to bring you up to the  
9 Update Exhibit 452 and page 16 of that Update.

10 MR. SMITH: A. Sorry, could I have the  
11 original reference?

12 Q. Yes, the original reference is  
13 Exhibit 3, page 14-11. It is just a very brief  
14 reference, Mr. Smith, on the right-hand side of the  
15 column.

16 A. Yes, I just wanted to read the entire  
17 comment as opposed to the statement you read out.

18 Q. Perhaps I will let the Board get the  
19 exhibit.

20 MS. PATTERSON: Do we need to see it?

21 MS. MacDONALD: No.

22 Q. Would you agree, Mr. Smith, that  
23 general summary is an accurate reflection of what is in  
24 that particular passage, that at that point Ontario  
25 Hydro is indicating natural gas is plentiful in the

1 short-term, but its long-term outlook is far less  
2 certain. It is a depletable resource with far less  
3 assured long-term reserves than coal. Future supplies  
4 of economic gas could become scarce.

5 MR. SMITH: A. Yes.

6 Q. So it's an idea of Hydro's views on  
7 gas at that point?

8 A. Yes.

9 Q. We wanted to contrast that then to  
10 the Update, Exhibit 542, at page 16 of the Update. And  
11 if you refer to that. I believe on that page Hydro  
12 indicates with respect to its view of natural gas:

13 This more prominent role for natural  
14 gas referred to in that section of the  
15 Update could only be contemplated if  
16 there were confidence that natural gas  
17 would be both available for electricity  
18 generation and attractively priced in the  
19 future.

20 At that point in the Update Ontario Hydro  
21 is viewing natural gas, if you will agree, in a more  
22 positive light, a little bit more optimistic light?  
23 Would that has been fairly summary, Mr. Smith?

24 A. Yes.

25 Q. We were interested in knowing the



1 kind of thinking that went into that change in position  
2 on natural gas by Hydro, just initially.

3 A. Essentially, it comes from having a  
4 lot more knowledge of the natural gas business than we  
5 had when the original plan was put together.

6 When the original plan was put together  
7 we were not a user of natural gas in any significant  
8 way at all, and I guess our views at the time were  
9 relying on advice we were receiving and a limited  
10 amount of information available in publications such as  
11 the National Energy Board views.

12 I guess what I have said in direct  
13 testimony and in response to a few questions this last  
14 week or so, has been the big change really is that the  
15 traditional information that is used in the natural gas  
16 business talks about proven reserves, and as we began  
17 to investigate the natural gas industry in more detail,  
18 it become apparent that people in the industry don't  
19 really look at proven reserves as the only measure or  
20 the full measure of their business. And that likely  
21 reserves and reserves that can be developed and are  
22 likely to be discovered, et cetera, have a very big  
23 part in their outlook. When we began to look at that  
24 we saw that the outlook for gas was much more positive  
25 in terms of its availability.



1                   Having said that, we still believe that  
2     relative to coal and uranium, for example, gas is more  
3     scarce or has a shorter measurable life compared to  
4     consumption levels. Coal is measured in hundreds of  
5     years already without further exploration and so is  
6     uranium.

7                   Q. But would you agree that there is an  
8     emerging school of thought that considers gas to  
9     provide some economic opportunities in the electricity  
10    market, that there is an emerging school compared to  
11    what I would call the traditional school or view of  
12    gas, that does see some opportunities there for the  
13    utilization of the gas product?

14                  A. Yes. I think there are two things  
15    that are changing and I think they are important they  
16    go together. One is that it is okay to use natural gas  
17    to generate electricity. If you recall, in the United  
18    States at one time they in fact outlawed the thought of  
19    using natural gas for electricity generation. And  
20    there was a general view, I think probably in North  
21    America, or Canada as well, that wasn't the best use of  
22    natural gas.

23                  So, I believe that that has changed  
24    somewhat partly because of the view that there is more  
25    gas around.

1                   The other is the view that perhaps in  
2           spite of what the gas industry tells us that natural  
3           gas prices may not go up as quickly as some forecasters  
4           say, I think that one people are concerned about though  
5           still and have to bear in mind in their decisions that  
6           gas prices could go up, and so the economics that one  
7           sees today may not prevail. So you have to take that  
8           into account.

9                   Q. All right.

10                  A. So I think certainly there are people  
11           who are jumping into the gas business and are planning  
12           on using it, and there are others who are cautiously  
13           looking at it as an option.

14                  Q. All right. We will come back to that  
15           cost assessment on natural gas very shortly. But if I  
16           could at this point ask you about, if you consider that  
17           the emerging view of the utility of natural gas, how  
18           does that fit into the assumed CTU lifespan?

19                  A. Well, I think the life that we set on  
20           CTUs is more of a physical life, it's not related to  
21           the resource.

22                  Q. Not related to the resource supply?

23                  A. I don't believe there was any  
24           consideration of the resource supply on the life. Mr.  
25           Dawson is the expert on plant life.

1 MR. MEEHAN: A. I think we would assume  
2 that the CTUs would be operated at a very low capacity  
3 factor and that they would also be dual-fueled. So I  
4 don't think the availability of natural gas for the  
5 peaking CTUs would have too much bearing over its life.

6 Q. Just a small follow up question.  
7 Would you consider that the resource available would  
8 outlast the CTU?

9 MR. SMITH: A. Yes.

10 Q. The CTU lifespan?

11 A. I'm sorry, I will qualify that.

12 The experts on plant life might say that  
13 the CTU, even though we are using 30 years, could in  
14 fact be 40, 50 or more, I don't know, at some time if  
15 we reassessed it based on performance and condition of  
16 the units.

17 Our outlook of the life that we are  
18 using is 30 years, and in my view gas supply will be  
19 available for that length of time or more.

20 MR. MEEHAN: A. The Plan Update doesn't  
21 have CTUs installed until very late in the time period,  
22 so I believe it's in the order of 2010 or so. So it  
23 would be 30 years from then I think that your question  
24 should apply to.

25 Q. In your view, Mr. Meehan, would the

1 supply last until then?

2 A. I am afraid I am not the expert. Mr.  
3 Smith is the expert.

4 MR. SMITH: A. I still give the same  
5 answer, I think the supply will be available.

6 Q. Thank you, Mr. Smith.

7 We wanted to start initially with just  
8 looking at Ontario Hydro, the way it forecasts natural  
9 gas prices. If you just bear with us, I am just going  
10 to give you a couple of transcript references. As we  
11 get into it I will try to keep the transcript  
12 references down because I know they slow down the  
13 process. But we were interested in your evidence, I  
14 believe it was Mr. Smith, in Volume 109 at page 19041.

15 At this point you were being asked about  
16 the method of forecasting and you mentioned at that  
17 point, DRI, the Data Resources International consulting  
18 firm, that they are one of the firms that Ontario  
19 Hydro's economics, I gather, department purchases  
20 forecasting services from. And we know the forecasting  
21 issue has been dealt with a little bit, but could you  
22 just expand a little bit on how Hydro goes about  
23 purchasing the forecasting, as from consultants like  
24 DRI?

25 A. Well, we produce our own forecasts,

1 but there are a number of firms, consulting outfits,  
2 that produce economic forecasts and energy price  
3 forecasts, and what the economics function of Hydro  
4 does is subscribe to some of those and they go through  
5 a process of selecting which ones they have some faith  
6 in, I suppose, and they would see what the consensus of  
7 those forecasts are or use the information in those  
8 forecast in developing their own. But I believe the  
9 forecast that we use internally that they produce is in  
10 fact our own forecast as it is influenced by the input  
11 of those other reports.

12 Q. We are going to begin a discussion by  
13 asking if Ontario Hydro has ever, rather than relying  
14 on consultant forecasts, has it ever gone into the  
15 market to test the gas prices in a direct way?

16 A. I'm not quite sure what you mean, but  
17 to go into the market to test the forecast?

18 Q. A brief moment, Mr. Smith. Mr.  
19 Barrett is assisting here.

20 We are wondering if, for example, you  
21 review commercial gas contracts. Would you be ever in  
22 a position of reviewing those types of contracts and  
23 then becoming aware of the numbers?

24 [11:14 a.m.]

25 A. Yes, I guess in two ways. Let me



1 say, we don't look at the details of contracts, but we  
2 review with the major gas utilities in Ontario their  
3 purchasing practices and what they foresee happening  
4 with gas price.

5 We also have had access to some of the  
6 gas supply arrangements envisaged in non-utility  
7 generation contracts where we go beyond the proposal to  
8 look at what their gas supply arrangements are, so we  
9 would have access to that information. Now, I haven't  
10 personally looked at all of those, but we have looked  
11 at some of them and certainly we have exchanged views  
12 and have discussions with our staff in the NUGs  
13 division about future gas outlooks from time to time.

14 Q. All right. I wonder, maybe at this  
15 point I will bring to you one of your overheads - I  
16 believe it is Exhibit 474, Mr. Smith - and I think it  
17 is page 7-B.

18 THE CHAIRMAN: I am sorry, what page in  
19 474?

20 MS. MacDONALD: Yes. It is 7-B, Mr.  
21 Chairman.

22 THE CHAIRMAN: 7-B?

23 MS. MacDONALD: Yes. It is just the next  
24 page to 7 -- S, sorry, S-7. And it is marked overhead  
25 7-B, "projections of future gas prices".



1 MR. SMITH: Yes, that I have. That was  
2 also an exhibit in the update.

3 MS. MacDONALD: Q. That is correct.  
4 Maybe initially, Mr. Smith, we have a note on the  
5 transcript of you referring very briefly to the group  
6 called Calgary consultants.

7 Could you indicate again perhaps more  
8 expansively what you understand that group to be, the  
9 Calgary consultants?

10 MR. SMITH: A. What I described was a --  
11 what we had done was we had commissioned an advisor to  
12 Ontario Hydro to do a study of gas price forecasts.  
13 And to be frank, we did that because we were becoming  
14 aware that there were diverging views on gas prices.  
15 And I mentioned in my testimony that the company we  
16 engaged was Little Engineering in Calgary. And this  
17 graph is really a summary of what they did for us.

18 The Calgary consultants was really his  
19 shrinking down of a number of forecasts that were being  
20 prepared by literally consultants that work out of  
21 Calgary. And I think it represents four or five  
22 different firms and he has just basically put them  
23 together as one line for in us our report.

24 Q. All right.

25 A. Probably because he undertook not to

1 reveal the individual forecasts.

2 Q. Would it be fair to say that the  
3 summary - calling them Calgary consultants - that these  
4 group of firms, that they do represent the gas  
5 industry, that they are a representative of their own  
6 industry?

7 A. Yes. However, I should say that I  
8 just saw an article in the paper this week wherein the  
9 Canadian Gas Association is forecasting that future  
10 natural gas price is going to go up at 5 per cent per  
11 year real which would put it up in those upper lines on  
12 this graph again.

13 At the same time they are forecasting the  
14 gas use is going to go up. By a large margin, I find  
15 that kind of an interesting self-defeating prophecy in  
16 my view. If they really believe prices are going to go  
17 up that fast, then I don't believe the gas use would go  
18 up as fast as they are predicting.

19 Q. Perhaps we can get into that in a  
20 little bit more detail. We are going to first just  
21 look at a few things in this particular graph.

22 As you have already indicated, Mr. Smith,  
23 there is - if you will just bear with us - there is  
24 this gap between Ontario Hydro's projection for gas  
25 prices in the Calgary consultants.

1 And we then wanted to bring you back --

2 I think we are going to have to combine that particular  
3 graph, Mr. Smith, and one of the Mr. Meehan's -- we are  
4 just going to work with the two graphs, if you will  
5 just bear with us for a minute.

6 Mr. Meehan, your material was Exhibit 471  
7 and the graph we were interested in was page M12.

8 Now, we are going to ask you if you will  
9 consider doing an undertaking for us. It is a bit of  
10 an exercise. And if we can first explain it and then  
11 you can indicate your views on whether you would  
12 consider entering into that undertaking.

13 What we were interested in is, if you go  
14 to your chart, Mr. Smith, and use what we will call the  
15 Calgary quotes, if you were to use that, those numbers,  
16 as your costing numbers, if you then went to Mr.  
17 Meehan's M12 chart and put in those, the Calgary quote  
18 numbers, would that not result in significantly lower  
19 numbers for options 5, 6 and 7 in terms of costing?

20 Our exercise, I will try to explain it a  
21 little bit better, but it is basically, we are  
22 wondering if you would consider putting in the Calgary  
23 numbers into Mr. Meehan's chart and we would like to  
24 see what the differences are in the numbers then on  
25 options 5, 6 and 7.

1 A. Could I consult, please?

2 Perhaps rather than doing a specific  
3 undertaking of that kind, we have examined the  
4 sensitivity of the work that is in Mr. Meehan's --  
5 well, the work we have done in the Update to the gas  
6 price forecast. And essentially what we have done is  
7 we have said, what if the natural gas price did not go  
8 up in real terms, which would be a proxy for that graph  
9 of the Calgary consultants? And if you want it very  
10 precisely, we would have to do an undertaking, but what  
11 we did it for was to find out what it would do to some  
12 of those options.

13 And I think what it would do basically is  
14 for the high capacity factor option of a combined-cycle  
15 plant, it would move those costs into a level that  
16 would be just slightly higher than the costs of the  
17 high capacity factor coal option. It would still be  
18 somewhat higher, but --

19 Q. But perhaps just slightly?

20 A. Well, the number I have here is 4.3,  
21 but I think this was done in a fairly -- you know, this  
22 wasn't done under the rigor of all the others, so I  
23 wouldn't want to put it in that -- that is an IGCC --  
24 that is the way it has been done. That would be the  
25 option 8, but you wouldn't put the coal gasifier on it

1 because the gas price stayed low. So the assumption  
2 would be that the gas price never went up in real terms  
3 or didn't go up enough to make you want to put a  
4 gasifier on, so it stayed as gas.

5 Q. Mr. Smith, if I could --

6 A. We probably better take an  
7 undertaking here.

8 Q. I was just going to add one  
9 additional aspect before we formally requested one.  
10 And we thought that this kind of information, we are  
11 interested in the detailed numbers and we thought that  
12 it might be of help to the Board to see if you are  
13 using the Calgary quotes, if you take it as an example  
14 of industry quotes, to have those numbers fed into Mr.  
15 Meehan's chart and for the Board to be able to see just  
16 what those prices would result in in terms of average  
17 capacity capability factor so that the Board could make  
18 an assessment of Hydro's ability to utilize the gas  
19 resource. So that is the reason we are asking for it.

20 MR. MEEHAN: A. By Calgary quotes, you  
21 mean the higher of those two lines that are on that  
22 figure?

23 Q. Yes.

24 A. Yes, we can do that work.

25 THE CHAIRMAN: What two lines are you



1 talking about, Mr. Meehan.

2 MR. MEEHAN: Well, there is Calgary banks  
3 and Calgary consultants and I am understanding that is  
4 it is the Calgary consultants figures that we will use.

5 MS. MacDONALD: Yes. Thank you, Mr.  
6 Meehan.

7 It is, Mr. Chairman, it is the use of the  
8 Calgary consultants' numbers to be fed into Mr.  
9 Meehan's graph, M12. And perhaps if we could have that  
10 undertaking formalized.

11 THE CHAIRMAN: Are we right in assuming  
12 that you used the Hydro numbers on Exhibit S-7B for  
13 chart M12; is that correct?

14 MR. SMITH: Actually, we used the numbers  
15 on my graph S-6, which is really a translation into  
16 the -- or S-7, I am sorry, a translation of the Alberta  
17 price into a delivery condition in Ontario for the  
18 update.

19 MR. MEEHAN: And there is more detail on  
20 that. As you can see, there is a price for 10 per cent  
21 capacity factor and one for 40 per cent and one for a  
22 higher per cent capacity factor, so it is more detail  
23 that we used in our LUEC analysis.

24 THE CHAIRMAN: So the analysis being  
25 asked would be a cruder analysis, I take it?



1 MR. MEEHAN: Yes. We just put in the one  
2 price. It might be better just to assume that the gas  
3 price doesn't increase and we just make sure that we  
4 have done the analysis right, if that is ...

5 MS. MacDONALD: There might just be a  
6 slight misunderstanding, Mr. Chairman. We don't think  
7 it would result in a cruder analysis. It would just  
8 indicate the gas commodity price. So we are asking for  
9 the Calgary consultants' numbers to be utilized in the  
10 LUEC calculation by Mr. Meehan, so it is that  
11 calculation we want.

12 MR. MEEHAN: I think what the Chairman  
13 was pointing out is that in the LUEC calculation, going  
14 across from 10 per cent to 80 per cent capacity factor,  
15 we have used different unit prices for gas which I am  
16 not sure we would have available using the single price  
17 from the Calgary consultants.

18 MS. MacDONALD: Q. That is what you  
19 meant by a rougher calculation?

20 MR. MEEHAN: A. Yes, that is all.

21 Mr. Smith is offering - it is unusual  
22 that he is [Laughter] - because what he was trying to  
23 do before was to avoid even be associated with a single  
24 undertaking because he has done well so far.

25 MR. SMITH: This is your undertaking.

1 MR. HOWARD: He is volunteering you.

2 MR. MEEHAN: But he says that we can do a  
3 similar breakdown to the Calgary consultants' figures  
4 prices and we will do an identical comparison to the  
5 LUEC production.

6 MS. MacDONALD: Thank you, thank you for  
7 your help.

8 THE CHAIRMAN: Can we have a 478 number,  
9 please?

10 THE REGISTRAR: .31.

11 ---UNDERTAKING NO. 478.31: Ontario Hydro undertakes  
12 to provide the calculation for the  
13 Calgary consultants' numbers to be  
utilized in the LUEC calculation.

14 MS. MacDONALD: Thank you.

15 Mr. Chairman, I am going to get at  
16 another couple of graphs and go on for a period of time  
17 on that.

18 Would it be an appropriate period of time  
19 to break?

20 THE CHAIRMAN: Yes. We will take a break  
21 for 15 minutes.

22 THE REGISTRAR: This hearing will recess  
23 for 15 minutes.

24 ---Recess at 11:28 a.m.

25 ---On resuming at 11:48 a.m.

1 THE REGISTRAR: Please come to order.

2 This hearing is again in session. Please be seated.

3 MR. MORAN: Sorry, Mr. Chairman, for  
4 being a few minutes late. Ms. MacDonald just got  
5 detained for a moment.

6 MS. MacDONALD: I am sorry for being  
7 late. We were trying to economize on the rest of the  
8 questions.

9 I also wanted to explain something which  
10 the Registrar kindly brought to my attention. And I do  
11 regret the last two exhibits that I referred to the  
12 Board, Exhibits 474 and 471, Mr. Meehan's, I had failed  
13 to -- I had forgotten to mention them to the Registrar.

14 THE CHAIRMAN: Don't worry about it. We  
15 all had them. They are sort of the core document of  
16 this particular panel.

17 MS. MacDONALD: But it was entirely my  
18 fault.

19 Q. And we have two more aspects for Mr.  
20 Smith and Mr. Meehan in terms of numbers and we have  
21 tried to economize them on the break, so hopefully this  
22 will go a little more quickly.

23 One of them flows directly out of what  
24 you were describing, Mr. Smith, in terms of your S-7  
25 exhibit. When we had asked you for the first

1       undertaking, you spoke then of the differences in the  
2       capacity factors on your exhibit S-7.

3                       MR. SMITH: A. Yes.

4                       Q. We were going to ask you, we would  
5       like you to consider providing us with a breakdown of  
6       how you arrive at these particular figures in your S-7;  
7       that is, we are interested in the assumptions that you  
8       used to come to these capacity factor numbers. And we  
9       are wondering if you might consider that as an  
10      undertaking. What we are interested in is the  
11      methodology. We would be interested in just how you  
12      arrive at that.

13                      A. Well, I can describe the methodology  
14      without getting into details. Essentially, what we  
15      have looked at is the lowest cost way to achieve gas  
16      supplies at those capacity factors. The 100 per cent  
17      capacity factor gas supply essentially says you use the  
18      same amount every hour, every day, all year long. And,  
19      therefore, when you contract for gas transportation  
20      services in Alberta and gas transportation services  
21      across the country into Ontario, you minimize the cost  
22      of transportation per unit of gas consumed.

23                      When we looked at lower capacity factors,  
24      we developed a supply program which would allow us to  
25      buy gas at 100 per cent capacity factor delivered to

1 Ontario but then deliver much of the gas into storage  
2 and then remove the gas from storage at the time we  
3 needed it which is the way to get your minimum cost  
4 supply for that capacity factor.

5 Similarly, for a 10 per cent capacity  
6 factor did the same thing. Again, you would have then  
7 a very low level of gas flowing across Canada on a  
8 daily basis. Most of it would be going into storage  
9 most of the time and then you would be withdrawing from  
10 storage.

11 So what we did was just what Union Gas  
12 and others tried to do to optimize their cost of gas  
13 is, we tried to model how you would do that using  
14 storage. So that is the methodology we used.

15 Q. All right. I will just provide you a  
16 little bit more detail and it may be more clear. We  
17 understand, of course, that there is a gas cost  
18 component and a transportation component, but what we  
19 are interested in is a sample calculation for a base  
20 year of 1991. We would like to see the breakdown into  
21 types of service and the assumptions for the toll  
22 rates, so it is that specific kind of breakdown that we  
23 would be interested in.

24 A. Well, I guess we have all that detail  
25 and we can do that. We can provide it. I thought you



1 wanted methodology and the toll rate assumption was no  
2 real change in the cost of tolls.

3 Q. Thank you, Mr. Smith.

4 A. So you do want the detail?

5 MS. MacDONALD: We do want the detail.

6 We will take you up on that.

7 And if that could be formalized, the  
8 undertaking.

9 THE CHAIRMAN: A 478 number, please?

10 THE REGISTRAR: .32.

11 ---UNDERTAKING NO. 478.32: Ontario Hydro undertakes to  
12 provide a sample calculation for a base  
13 year of 1991 showing the breakdown into  
types of service and the assumptions for  
the toll rates.

14 MS. MacDONALD: Q. And again, we are  
15 pursuing you with possibly yet another undertaking, Mr.  
16 Smith, but --

17 THE CHAIRMAN: Why don't you ask a  
18 question and if they can answer it satisfactorily, you  
19 don't need an undertaking; and if they can't answer it  
20 satisfactorily, there may be an undertaking.

21 MS. MacDONALD: All right, Mr. Chairman,  
22 I will do that.

23 Q. We would like to take you to your  
24 Exhibit S-6 and that is the forecast prices for coal,  
25 oil and natural gas.



1 [11:50 a.m.]

2 I would like you to confirm that this  
3 represents a high annual capacity factor for 1989, this  
4 particular chart. It's in 1989 dollars.

5 MR. SMITH: A. Yes, it does, but the  
6 expected utilization of coal that we see throughout the  
7 forecast period of the plan does not make our delivered  
8 price of coal sensitive to capacity factor.

9 If we got down to very, very low usages  
10 of our coal system, then it would be sensitive to that.  
11 But within of the range that we have analyzed it, it  
12 isn't sensitive to the capacity factor, so it's valid  
13 over a fairly broad range of deliveries.

14 If we were down to 3 million tonnes a  
15 year of coal use, then I would have a different price  
16 forecast and I would have to do it.

17 Q. Just to make it more clear, we are  
18 interested specifically in the gas, the gas forecast.

19 A. I am sorry, you said coal.

20 Q. I'm sorry, that was my reading of the  
21 chart.

22 So, if we are looking just at the gas,  
23 could you confirm that the diagram represents a high  
24 annual capacity factor for gas for the year 1989?

25 A. We have two gas lines on that graph,

1 one is interruptible --

2 THE CHAIRMAN: You have four, don't you?

3 MR. SMITH: I am sorry, she was referring  
4 to S-6, I believe. Is that right?

5 MS. MacDONALD: Yes.

6 THE CHAIRMAN: I'm sorry. I was looking  
7 at S-7.

8 MR. SMITH: So we are going back to the  
9 one that was the basis for the original Demand/Supply  
10 Plan.

11 MS. MacDONALD: Q. It was. And it was  
12 the line N gas general.

13 MR. SMITH: A. Yes. And we described  
14 that I believe in the original submission and certainly  
15 in my direct evidence as being a proxy which we used  
16 and it was fairly rough, and we assumed that it would  
17 be a general service condition at -- I would have to  
18 check this, but I believe we said fairly high capacity  
19 factor, 50 per cent capacity factor. Something in that  
20 range.

21 Q. All right. If you will just consider  
22 that. I am just going to take you now to the next  
23 chart, S-7. And you see where the two charts of course  
24 are in different energy values, first '89 chart in  
25 dollars per gigajoule and the S-7 chart in '91 dollars

1 per MM Btu.

2 A. Yes.

3 Q. I will tell you what we are  
4 interested in. Would you confirm that this particular  
5 '91 price represents that the actual price in '91 was  
6 significantly lower than the 1989 forecast. That's  
7 what we are interested in.

8 A. Yes, I think I said, again in my  
9 direct, that basically one of the changes from forecast  
10 to forecast was there had been no real increase; in  
11 fact, there had about a real decrease in many cases in  
12 the fuels between '89 and '91. So we were starting at  
13 '91 at that lower base and then going forward. So,  
14 yes, it was at a lower price in 1991.

15 Q. Would you be able to advise how much  
16 lower it was in '91? We have done a rough calculation.

17 A. Well, I think the detail was  
18 provided. We have answered a couple of interrogatories  
19 and one of them was 8.2.18 where there were details of  
20 all the various prices. I think that would show the  
21 '91 delivered price on that graph, and we also provided  
22 a response to an interrogatory on the original basis  
23 for the DSP and the thermal study, which also had all  
24 the details of all the prices for each year for 40 or  
25 50 years, so I think they are directly comparable from

1       that.

2                   THE CHAIRMAN:  Sorry, what was the  
3       second?

4                   MR. SMITH:  I'm sorry, I don't have the  
5       reference to the second one with me.

6                   THE CHAIRMAN:  Can we record the first  
7       one, 8.2.18, please.

8                   THE REGISTRAR:  That will be .35.

9                   THE CHAIRMAN:  Thank you.

10                  MR. HOWARD:  Mr. Chairman, I am told that  
11       that interrogatory is already Exhibit 475.2.

12                  THE CHAIRMAN:  All right.  Thank you.

13                  MS. MacDONALD:  Thank you, Mr. Howard.

14                  THE CHAIRMAN:  So we can scrub 35 then.

15                  THE REGISTRAR:  Yes, we can.  Thank you.

16                  MS. MacDONALD:  Q.  Mr. Smith, I wonder  
17       if you could give us a ballpark figure.  We have done a  
18       rough calculation.  If you were to ballpark it, we have  
19       come up with just a rough figure that there is a  
20       differential between the years '89 and '91 of 60 to 70  
21       cents.  Does that sound like it is in the range?

22                  MR. SMITH:  A.  For firm gas supply?

23                  Q.  That's correct.

24                  A.  I don't think so.

25                  Q.  You wouldn't agree with that?

1 A. No.

2 Q. I wonder if you could work out your  
3 own figures for that and provide that to us then?

4 A. That's part of the undertaking, I  
5 think, isn't it?

6 Q. Yes

7 Perhaps if we could just formalize that  
8 undertaking number.

9 THE CHAIRMAN: 478.

10 THE REGISTRAR: .33.

11 THE CHAIRMAN: Are you going to add it to  
12 the last one? We can add it to the last one?

13 MR. HOWARD: I thought Mr. Smith  
14 indicated that that would be in 478.32, Mr. Chairman.

15 THE CHAIRMAN: Okay. All right.

16 MR. SMITH: I think we assigned 33 to  
17 explain the difference between the two forecasts, and I  
18 guess all I am saying is that obviously in doing so, it  
19 would identify the amount of the difference, so it's  
20 part of the same undertaking.

21 MS. MacDONALD: That would be  
22 satisfactory then.

23 Q. We are pursuing another area, and we  
24 will ask you for this information, Mr. Smith, to see if  
25 you can provide it. It goes back again to evidence of



1 Ontario Hydro's awareness or testing of the market  
2 numbers on natural gas. We are aware that there are  
3 gas supply contracts for export that are filed with the  
4 National Energy Board, and these gas supply contracts  
5 can be for a number of terms we are interested in,  
6 Ontario Hydro providing to us the last 15 contracts  
7 filed in this year for a term of at least 15 years and  
8 the details of --

9 THE CHAIRMAN: Hold it, I am not clear  
10 what you're asking for. You are asking for their  
11 contracts?

12 MS. MacDONALD: No, these are public  
13 filings, Mr. Chairman.

14 THE CHAIRMAN: I think if you can get  
15 them then I don't see why Hydro should get them.

16 MR. HOWARD: Thank you, Mr. Chairman.

17 Anyway, they are all up for cancellation.

18 [Laughter]

19 MS. MacDONALD: Q. Well, we will go into  
20 another area, Mr. Smith, that is interruptible  
21 contracts, and the Ontario Natural Gas Association  
22 counsel dealt with it but quite briefly. We wanted to  
23 ask you a few questions on that.

24 You have spoken of the nature of  
25 interruptible contracts in Volume 109 at page 19033.

1 There Mr. Howard at line 18 asked to you amplify on  
2 what you meant by interruptible, and you went on in  
3 line 20 to indicate:

4 "It is a gas service that from the gas  
5 industry, you cannot rely on it to be  
6 delivered at all times to you. You get a  
7 discount because of that. They have a  
8 right to interrupt it. We also view it  
9 as a gas supply which we do not have to  
10 commit to for any lengthy period of time,  
11 so it has value to us because our demand  
12 would be quite uncertain."

13 And we just have an initial question.

14 When you speak of interruptible, are you speaking of  
15 interruptible service, service on the distribution  
16 system or the transmission system as well?

17 MR. SMITH: A. It could be both.

18 Q. It could be both?

19 A. Yes.

20 Q. I wonder if you could take a minute,  
21 Mr. Smith, and just explain the difference between  
22 that, between the interruptible service on the  
23 distribution system versus the transmission system?

24 A. Well, the fundamental difference is  
25 that one of them is transporting the gas across the

1 country, and the other is transporting it within the  
2 system.

3 Again, the interruptible transmission  
4 across the country is subject to its availability.  
5 There are times of the year when it's very difficult to  
6 get that service.

7 It's more available in the local  
8 distribution system because you then incorporate  
9 storage and the ability to get gas from other places  
10 other than strictly from the TransCanada PipeLine  
11 system. You can get gas from United States, for  
12 example, through the Union system. So that is the  
13 distinction I would make.

14 Q. Yes. What we wanted to put to you  
15 was another type of gas contract that is an alternative  
16 gas contract which has been called the downstream  
17 diversion contract. Are you familiar with that type of  
18 contract?

19 A. Not precisely.

20 Q. I will, in my layman's way, I will  
21 try to provide, I hope, a useful summary of this type  
22 of system.

23 The down or upstream system is an  
24 alternative type of gas contract utilizing the  
25 TransCanada PipeLine system which, of course, comes

1 through Ontario, and it is a system whereby, for  
2 example, a utility like Hydro, for example, in London,  
3 could take advantage of the pipeline connection to an  
4 American generator and could contract with that  
5 American generator for gas for 10 to 15 days of the  
6 year only; that is, the number of days can be variable,  
7 but just hypothetical, this particular utility  
8 contracts with an American generator for just 10 to 15  
9 years of gas.

10 MR. HOWARD: Years or days?

11 MS. MacDONALD: Q. Ten to fifteen days  
12 of gas over one year.

13 That particular American utility then is  
14 required on demand -- when the American generator  
15 receives the demand, has to provide that gas, and if  
16 the American generator then, if it does receive the  
17 demand, gets its own supply from alternative gas  
18 pipelines or the burning the fuel oil, but it is  
19 required under the contract to then provide the gas to  
20 the utility in Ontario.

21 We wondered if Ontario Hydro had ever  
22 considered or examined this type of alternative gas  
23 contract as opposed to the interruptible?

24 MR. SMITH: A. Yes. I just didn't  
25 recognize it under the term you described it, but yes

1 we examined that very carefully when we were  
2 considering the restart of the Hearn Generating Station  
3 and we were obviously going to be coming on stream  
4 before we could apply for any expanded capacity on the  
5 TransCanada PipeLine, and that was one example that we  
6 used.

7 If effect, what it does is it allows us  
8 take the gas that's coming through the system from  
9 Canada to that U.S. buyer and take it on our own and  
10 then they find another way to get their gas supply.

11 It really just uses the diversity of the  
12 system and storage capabilities and additional  
13 transmission capability that exists in the United  
14 States to everyone's advantage.

15 Q. What does Ontario Hydro call that  
16 type of contract, not the downstream?

17 A. I don't call it anything. I just  
18 look at it as a way of getting the gas supply without  
19 having a firm contract with TransCanada PipeLine.

20 Q. Would you agree, Mr. Smith, that type  
21 of contract can provide an opportunity, as you said, to  
22 take advantage of the availability of alternate  
23 pipelines that the American generators may have, so it  
24 provides a degree of flexibility?

25 A. Yes.



1 Q. You have indicated that Ontario Hydro  
2 did look at this type of contract with respect to  
3 Hearn. Can we ask what your analysis of that type of  
4 contract was, what your view of it was?

5 A. It would have been a useful mechanism  
6 for us to use along with any other arrangements we were  
7 making for gas supply.

8 Q. Have you pursued that, followed that  
9 up and taken advantage of that contract opportunity or  
10 was it --

11 A. No, because we had no need for gas.  
12 We are not starting the Hearn up again, so where we got  
13 to, we just abandoned the process.

14 Q. Just one short follow-up question.  
15 Could you see that type of contract, the downstream  
16 contract, having any utility for a peaking use of gas?

17 A. I think you could. Again, its value  
18 is going to be very dependent upon the match you can  
19 make with the other side of the border and their usage,  
20 but it's a potential way to offset the interruptible  
21 nature of the supply relying only on Ontario resources.

22 Q. A brief moment.

23 We are slowly moving out of gas. We just  
24 have a very sort questions and then we will be  
25 getting into IGCCs and then life extension issues,

1 hopeful briefly.

2 I wonder if I could just ask you a series  
3 of very short questions, Mr. Smith, on gas.

4 The first one. If you could explain the  
5 technology of co-firing natural gas with coal.

6 A. I think Mr. Dawson could probably do  
7 a better job of it than I can. I am aware of the  
8 technology and we have considered it, but Mr. Dawson is  
9 the expert.

10 Q. Thank you.

11 I wonder if you could, Mr. Dawson,  
12 explain that co-firing technology?

13 MR. DAWSON: A. You simply burn the two  
14 fuels in the same furnace at the same time, though it's  
15 not always that simple because you have got to be able  
16 to balance the input of coal and balance off the heat  
17 input you are already getting from the gas, so you end  
18 up with a rather complex control system to control the  
19 fuel input.

20 Every time we talk about it to our boiler  
21 designers they shudder. So it's not a simple thing to  
22 do. We prefer the idea of either burning gas or  
23 burning coal, but not the two simultaneously.

24 Q. We were going to ask you, Mr. Dawson,  
25 on the state that technology, what you viewed the

1 technology as?

2 A. I think we have just given you that.

3 Q. Just indicated it?

4 A. Yes.

5 THE CHAIRMAN: I am sorry, I didn't hear  
6 your last answer?

7 MR. DAWSON: I'm sorry. I said I said I  
8 think we have just given our views on it, that we don't  
9 like very much because it's so complex.

10 MS. MacDONALD: Q. Does that type of  
11 co-firing have any particular environmental advantage,  
12 just before we leave that, Mr. Dawson?

13 MR. DAWSON: A. There is a technology  
14 that's being developed that would burn gas up in the  
15 top end of the furnace, above the coal-fired units, and  
16 what you do is burn it with an inadequate supply of  
17 air, and in fact that is one way of converting nitrogen  
18 oxides by to elemental nitrogen. So it's an approach  
19 to reducing nitrogen oxide emissions. It's very much  
20 dependent, though, on the furnace design and the volume  
21 of furnace that's available in which the reaction takes  
22 place. So again it's not a simple thing to do. We are  
23 looking at that sort of an approach, but I think we  
24 need to do a lot more work before we would be prepared  
25 to commit to something like that.

1 [12:14 p.m.]

2 Q. Thank you, Mr. Dawson.

3 We realize, of course, that you are not  
4 the NUG panel, but we have a few questions on NUGs and  
5 the gas use industry.

6 So, if you could allow us to question you  
7 on a few of the NUG details.

8 Are you aware that approximately -- are  
9 you aware of what percentage of the NUGs that have been  
10 offered to Ontario Hydro in response to the request for  
11 proposals? So it is just a basic informational  
12 question of what percentage of NUGs were - is it  
13 coal-fired - gas-fired? So what percentage of NUGs in  
14 the proposals to Ontario Hydro were gas-fired.

15 MR. SMITH: A. I think Mr. Vyrostko  
16 probably answered that on Panel 5. Without looking at  
17 the transcript though, I am aware that certainly the  
18 majority of them would be gas based.

19 Q. These combined-cycle gas-fired units,  
20 the NUG units, were they essentially base load  
21 facilities?

22 MR. SHALABY: A. I don't know whether  
23 Panel 5 would have been the more authoritative source  
24 as to exactly what the proposals look like. We can  
25 give our impressions of what the proposals are like,

1 but I presume that Panel 5 dealt with this to a large  
2 extent.

3 Q. As my colleague has indicated,  
4 perhaps I should move directly to the point and I will.  
5 It is just this issue: It does seem on considering  
6 Hydro's evidence on their approach to gas that in terms  
7 of base load capacity, that Ontario Hydro's view is  
8 that natural gas is perhaps a more appropriate peaking  
9 fuel.

10 I was interested in the contrast with the  
11 NUG development in which it seems that the development  
12 of gas-fired NUGs is in the base load application area.  
13 So there does seem to be this inconsistency in approach  
14 on gas that I was going to question you on. Or what we  
15 perceive is an inconsistent approach.

16 MR. SMITH: A. I don't know whether the  
17 inconsistency lies in the basis of the supply of fuel  
18 so much as it is the view -- let me say, I don't think  
19 there is an inconsistency.

20 When we entertain proposals for  
21 non-utility generation, we have a threshold cost that  
22 they must meet. It has to make sense for us to buy  
23 that capacity and energy. And if they can do that with  
24 the terms and conditions that they are able to  
25 negotiate and provide us a proposal that meets that



1 criteria, then they get into the game of negotiating  
2 further with Hydro to develop a contract.

3 We do - and again, I am sure Mr. Vyrostko  
4 dealt with this in great detail - but we look at what  
5 is behind their contract proposal in terms of the fuel  
6 supply and the security of that supply and the pricing  
7 provisions in that supply before we undertake to make  
8 the deal.

9 The proposer does take some risks in the  
10 process at some time that his gas supply could come in  
11 at a price that is different than he is recovering from  
12 Ontario Hydro. So in the long run, it is not clear  
13 that the base load gas supply will be the right choice  
14 in the long term.

15 Q. Thank you, Mr. Smith.

16 A. Now, they build in -- and  
17 cogeneration, of course, Mr. Burpee has mentioned to  
18 me, brings a whole different level of efficiency into  
19 the picture too, which offsets some of the cost.

20 Q. So that is a factor as well then?

21 A. I think what is happening in most of  
22 those contracts is that the supply for gas has various  
23 pricing provisions in it that the NUG brings forward as  
24 the basis for its proposal to Hydro and they have to  
25 have a ten-year supply for starters-because they can't

1 get into the pipeline system, but then there are  
2 different kinds of pricing proposals that they  
3 negotiate with the gas industry in Alberta for the gas,  
4 all of which are geared to protect them against high  
5 prices of gas.

6 When that is all factored into the  
7 equation, if it still looks attractive in the total  
8 picture for Ontario Hydro, then we undertake an  
9 agreement. There is always the risk that those pricing  
10 proposals would turn out to be higher than you could  
11 have had you just bought the gas on the open market, so  
12 there are two sides to that coin at all times.

13 Q. I know you mentioned earlier in your  
14 evidence recent information you had on, I believe it  
15 was, the National Gas Association's view of upcoming  
16 gas prices.

17 But would you agree that, at least, in  
18 the present market, there does appear to be an  
19 opportunity in terms of low gas prices and abundance of  
20 supply that the present market conditions do indicate  
21 gas opportunities?

22 A. Yes.

23 MR. MEEHAN: A. I think you have to  
24 understand too that we are not in need of any gas-fired  
25 generation for some years.

1 Q. I think you mentioned that, Mr.  
2 Meehan. Is it 2009, that point?

3 A. Yes, it is about that point.

4 Q. About that year?

5 I think those are our questions on gas.  
6 My colleague a bit later will be doing a portion on  
7 IGCC, to just review some of that briefly, but I  
8 wondered if I could just review very briefly some life  
9 extension issues with you at this point.

10 Again, trying to move along quickly,  
11 perhaps the very best thing is to go to a certain part  
12 of the transcript in which one of the questions from  
13 Dr. Connell really brought out our concern and  
14 questions very, very clearly. It is Volume 110, page  
15 19220.

16 If I could just direct you into the  
17 transcript, Dr. Connell had asked a series of questions  
18 with respect to environmental control implementations.  
19 At this point, his question on line 8 is:

20 "Just to take a hypothetical case,  
21 suppose you came to the conclusion" -- I  
22 am not sure -- oh, it is Mr. Meehan who is being  
23 questioned by Dr. Connell -- "suppose you came to the  
24 conclusion that you were going to install  
25 scrubbers something on the scale of the

1 Lambton conversion at the age of 40. Can  
2 you speculate as to how many years of  
3 life expectancy you would have to have  
4 beyond 40 to justify that?"

5 And Mr. Meehan indicated:

6 "To justify it economically, I would  
7 have to guess at that, but I think you  
8 would want to see 15 years of life if you  
9 installed them at year 40."

10 And you indicated:

11 "In the order of I would think more  
12 than ten years."

13 And Dr. Connell follows up:

14 "Yes. So there might be, just for  
15 that reason alone, good reason to look at  
16 earlier installation?"

17 And our issue is this: I believe it was  
18 Mr. Meehan's evidence indicating that Hydro is  
19 considering the life extension but at this point is not  
20 wedded to the idea, if I could just phrase it that way,  
21 and yet, there have been plans put in place, for  
22 example, for the two FGD units, the scrubbers at  
23 Lambton, to come in as early as 1994 at a cost of 537  
24 million.

25 Our issue is, if you do have to get into

1 the cost of environmental controls or scrubbers and  
2 this type of environmental technology as early as 1994,  
3 when would you then have to make real decisions on life  
4 extension?

5 MR. MEEHAN: A. Oddly enough, it was  
6 exactly the first pair of scrubbers that I was using in  
7 my determination that 15 years would be about a  
8 breakeven because being installed in 1994 and having  
9 the 40-year life of 2009 is 15 years. And, in fact, at  
10 the time that we committed that pair of units, it was a  
11 breakeven situation with respect to burning low sulphur  
12 coal. So, that formed the basis of how I picked the 15  
13 years actually.

14 Does that answer your question? The  
15 first pair of scrubbers, not having reviewed the  
16 economics of that decision lately, but that decision  
17 took almost that entire period to break even.

18 Q. The full 15 years?

19 A. Almost the full 15 years.

20 The situation has changed now, so it may  
21 be sooner or later. We haven't done that work, but it  
22 is certainly one of the things that we would have to do  
23 when we go to commit any other facilities.

24 I think I mentioned that within the year,  
25 we would expect to commit the second pair if, in fact,



1 we intend to meet the 1997 date for the second pair  
2 that is planned.

3 Q. Your evidence was that. I think last  
4 week you mentioned that, Mr. Meehan.

5 A brief moment.

6 We will just follow up just with a brief  
7 question, Mr. Meehan, out of that: Would Hydro  
8 consider that if you went to gas-fired CTUs that it  
9 would give Hydro more flexibility with respect to  
10 energy production than the route of consideration of  
11 life extension and the implications for environmental  
12 controls?

13 A. The question is related to a decision  
14 that centres around 2009 at the earliest and whether or  
15 not we would have more flexibility with gas-fired CTUs  
16 than with life extension.

17 I am guessing at that, but I don't think  
18 that we would think that we would have more flexibility  
19 than by life extension.

20 Q. Has there been any analysis of that  
21 issue to your knowledge, Mr. Meehan?

22 A. Not that I am aware of, not with  
23 respect to flexibility. I think it would depend on the  
24 gas contract that we would have and all of that sort of  
25 thing.

1 Q. This is just a brief technology  
2 question. It might be Mr. Dawson, I think, on SCRs as  
3 a new technology, was it you, Mr. Dawson, who spoke of  
4 SCRs?

5 MR. DAWSON: A. That is correct.

6 Q. I recall your evidence that there is  
7 a pilot project ongoing with an SCR, that Ontario Hydro  
8 is involved with that.

9 A. There isn't an ongoing pilot project.  
10 We are currently planning a pilot project.

11 Q. Thank you.

12 A. That is as far as it has gone so far.

13 Q. We just have some questions on the  
14 SCR technology for you, if you will.

15 You referred to the plans for the pilot  
16 project in Volume 108 at 18986. And I won't refer you  
17 into that, but we are interested in your view of the  
18 effectiveness of this new technology.

19 A. The effectiveness of SCR technology,  
20 in terms of removal efficiency, it is highly effective.  
21 You can achieve 80 per cent removal. And that has been  
22 demonstrated in other parts of the world, Japan and  
23 Germany, specifically.

24 The only issue of concern in my mind is  
25 that a lot of North American coals have not been used

1 with SCR. There are potential trace elements in coals  
2 that can poison the catalyst in SCR and that is why I  
3 think we need a pilot plant, not to prove or disprove  
4 that SCR will work but to ensure that the coals that we  
5 plan to use it on are not going to have adverse effects  
6 on catalyst life because the economics are very  
7 sensitive to catalyst life.

8 Q. Would this type of poisoning that you  
9 mentioned, would that be a problem with gas, for  
10 example?

11 A. No, no, it wouldn't be a problem with  
12 gas. And, in fact, SCR technology has been used on  
13 combined-cycle plant. You cannot use it on gas  
14 turbines though because the temperatures at the exhaust  
15 of the gas turbine are too high.

16 Q. So just on the combined cycle then?

17 A. You can use it on combined cycle  
18 where the heat is recovered from the exhaust of this  
19 turbine.

20 Q. Has Hydro perhaps considered that use  
21 of the SCRs, Mr. Dawson, with that type of gas  
22 facility?

23 A. I am sorry?

24 Q. Has Hydro considered that use of SCR  
25 with the gas facility rather than coal?

1                   A. We have considered it and costed it  
2 out on the basis that SCR would be used with combined  
3 cycle certainly if the combined-cycle plant was going  
4 to run at intermediate or high capacity factors.

5                   Q. You would consider it at that point  
6 then?

7                   A. We considered what?

8                   Q. You would consider it at that point,  
9 if it was going to be used at intermediate or base load  
10 capacity?

11                  A. Yes.

12                  Q. Thank you. We just had two  
13 particular areas of questioning, one that you have  
14 touched on already, is that in North America, there  
15 really is no experience yet with using SCRs with coal  
16 and we wondered if Hydro was concerned perhaps on some  
17 uncertainty.

18                  Obviously, there is a pilot project being  
19 planned to explore that, but would you agree there do  
20 seem to be uncertainties with respect to costs, level  
21 of performance and, for example, the life of that ---  
22 facility? Would you go that far to say there is  
23 uncertainty?

24                  A. Not in terms of cost. I think the  
25 only question is, is there a bad actor in the coal that

1 is going to give you a problem? I think if we found  
2 that was the case, we would change the coal. We will  
3 use a different coal in the facility that has got the  
4 SCR. So, I think it is just a question of making sure  
5 that we don't get ourselves into trouble in terms of  
6 SCR coal combinations.

7 We have had some -- at the moment, we are  
8 looking at concept level studies but fairly good  
9 quality detailed studies of how we would retrofit SCR  
10 to Lambton and Nanticoke and I think we have got a  
11 reasonable level of confidence in the estimates that we  
12 have got.

13 Q. All right. Thank you. And just a  
14 couple of just small questions. We were interested in  
15 your view of any lead times involved. What type of  
16 lead time might be involved with an SCR technology?

17 A. That depends to some degree on  
18 whether we find we have to go through an environmental  
19 assessment. And if you follow what happened with flue  
20 gas desulphurization, we would. And so, it is probably  
21 a matter of a year and a half, two years, something of  
22 that order for that process. And in parallel with  
23 that, we would be doing the definition phase work. And  
24 then you have got the installation period which is  
25 probably another year and a half. It is similar in



1 terms to FGD lead times, but I don't have the specifics  
2 with me.

3 Q. Thank you. And this is just one  
4 question that stands on its own, but I am not sure to  
5 whom I should direct it, but we call it "episode  
6 strategy approach".

7 If we give you a scenario of one of the  
8 summer days in Toronto that cause so many difficulties  
9 in terms of health impacts as smog, a smoggy day in,  
10 for example, downtown Toronto. And we were interested  
11 in your evidence about the potential use of Lennox for  
12 dual capacity. And we wonder if Hydro might consider  
13 on that type of a day whether, if gas was available at  
14 Lennox, would Hydro consider burning the gas instead of  
15 firing the coal generator at Nanticoke? Would that be  
16 a way to deal with a certain episode problem?

17 MR. MEEHAN: A. That would certainly be  
18 one way of dealing with it, yes. Whether we would do  
19 that, I think, would depend on a number of things and  
20 what other options we would have available. As you  
21 know, we don't have gas at Lennox now.

22 One of the notions that we have for  
23 looking into putting gas into Lennox is, in fact, to  
24 take advantage of it during the summertime period. We  
25 expect the price would be low for gas and that it could

1 provide that environmental benefit.

2 Q. Thank you.

3 MR. BURPEE: A. I would like to add to  
4 that, I am not sure Nanticoke has any control order  
5 that would cause it to be reduced now but Lakeview  
6 does.

7 Q. Lakeview does?

8 A. Lakeview specifically does,  
9 especially in terms of, it has a limit on the net  
10 generation output depending on whether it is an  
11 on-shore wind or an on-shore inversion regardless of  
12 any air pollution index. And then once you get to the  
13 air pollution index stage, then there's successive  
14 reductions in generation that is handled through the  
15 system control centre.

16 Q. That is helpful. Thank you, Mr.  
17 Burpee.

18 [12:35 p.m.]

19 If you will just bear with me, I just  
20 have a few odds and ends of issues, if I can just  
21 locate them.

22 My colleague is very efficient. He is  
23 going to deal with one issue while I look for my  
24 remaining questions.

25 MR. MORAN: Mr. Chairman, I intend to ask

1 a few questions about solid waste issues, and in  
2 particular relating to flue gas desulphurization.

3 FURTHER CROSS-EXAMINATION BY MR. MORAN:

4 Q. Dr. Effer, as I understand the  
5 current approval that Ontario Hydro has received for  
6 flue gas desulphurization applies to the units at  
7 Lambton and Nanticoke, and I am wondering if you could  
8 confirm that one of the conditions of approval is to  
9 ensure that the gypsum, which is the end product of the  
10 technology, has to be of marketable quality, can you  
11 confirm that that is an actual condition of approval?

12 DR. EFFER: A. Yes. We committed to put  
13 in facilities to ensure that it would meet gypsum  
14 wallboard quality, yes.

15 Q. For the original approval I  
16 understand that there was some contact with the  
17 wallboard industry. I am just wondering if you  
18 actually determined in that process what the actual  
19 quantity of gypsum produced by these units would  
20 actually be, and in addition, whether you have got an  
21 understanding of how much gypsum the wallboard industry  
22 actually needs?

23 MR. DAWSON: A. I think that was  
24 discussed in previous cross-examination, and there is  
25 also an interrogatory that dealt with that quite fully

1 and talked about the total amount of gypsum that is  
2 currently converted to wallboard annually, which I  
3 think is 2-1/2 million tonnes, and our production rates  
4 too.

5 THE CHAIRMAN: Have you had a chance to  
6 review the AECL cross-examination? They went into in  
7 extensively.

8 MS. PATTERSON: And somebody else went  
9 into it before that.

10 MR. MORAN: Unfortunately, Mr. Chairman,  
11 I haven't.

12 The question I was leading up was simply  
13 if they have redone the calculations given the change  
14 of life extension and increased reliance on FGD to see  
15 if in fact it's still --

16 THE CHAIRMAN: Perhaps could you ask them  
17 that question. I don't remember if Ms. Findlay asked  
18 that question or not.

19 MR. MORAN: Q. With respect to the new  
20 direction which involves greater reliance on FGD units  
21 and therefore greater production of marketable gypsum  
22 presumably, have you re-analyzed to determine if the  
23 wallboard industry in Ontario can actually use this  
24 potentially increased production of gypsum?

25 MR. DAWSON: A. No, we haven't done that

1 specifically at this point, no.

2 Q. In addition, are you aware that  
3 currently there is a trend amongst landfill site  
4 operators towards rejecting the disposal of drywall at  
5 the sites?

6 A. Yes, I know it's not something that  
7 landfill operators particularly like in landfills,  
8 but we weren't proposing to put it into a commercial or  
9 municipal landfill, it would be stockpiled on our own  
10 property and we designated areas that were for that  
11 purpose in the environmental assessment, if we can't  
12 sell it.

13 Q. Are you aware that in Ontario there  
14 is a trend towards greater reutilization of scrap  
15 drywall having being committed to by the building  
16 trades?

17 A. No, I wasn't specifically aware of  
18 that, no.

19 Q. You will agree if there was such a  
20 trend, that in fact the demand for gypsum would go down  
21 given that there would be greater recycling of drywall?

22 THE CHAIRMAN: That wouldn't necessarily  
23 follow.

24 MR. MEEHAN: I understand that they can  
25 only accept in the order of 20 per cent drywall into



1 the new batch because it has the paper on it and that  
2 causes trouble with the process. The industry is  
3 utilizing more used drywall or broken drywall in their  
4 product, but they can't, with the processes that they  
5 have now, use a great deal of it.

6 MR. MORAN: Q. But there is a trend  
7 towards increased use.

8 MR. MEEHAN: A. Yes, there is.

9 Q. And you will agree that presumably  
10 people are looking at improving the technology to allow  
11 a greater use as well, particularly if it can't be  
12 disposed of in landfill site. I am just wondering --

13 MR. DAWSON: A. I should perhaps add  
14 that I think it is also true, though I can't speak to  
15 this in detail, that the Ontario drywall industry is  
16 looking at expanding its market over the border, and  
17 that's part of the interest in FGD gypsum too. So it's  
18 not a fixed market; it could be an expanded market.

19 Q. Has Ontario Hydro explored the  
20 possibility of out-of-province sales of the gypsum, the  
21 increased production of gypsum they would expect from  
22 increased reliance on FGD technology?

23 A. I'm sorry, have we explored?

24 Q. The possibility of an out-of-province  
25 market for the potentially increased production of

1 gypsum?

2 A. No. What we will do, when we get  
3 around to adding FGD, we have already looked at an FGD  
4 gypsum market for the first two units at Lambton. We  
5 understand from the wallboard manufacturers who are  
6 involved with us at Lambton that they prefer to see and  
7 use all the production from Lambton from four units,  
8 not at two.

9 When we get around to looking at  
10 Nanticoke, what we will do, I think, is going through a  
11 similar process and ask for proposals. And since is  
12 located a lot closer to large wallboard manufacturers  
13 than Lambton is, I suspect that we will certainly see  
14 some interest, but whether it will be enough to absorb  
15 all the gypsum or not I don't know. We will find out  
16 when we get there.

17 Q. You mentioned just a few minutes ago  
18 that if it couldn't immediately be used that you would  
19 stockpile it. Presumably after you do a certain amount  
20 of stockpiling you will have a space problem. Have you  
21 given any analysis to that..

22 MR. HOWARD: It's going to be a ski hill.  
23 [Laughter]

24 MR. DAWSON: In the environmental  
25 assessment we have laid out the disposal areas that

1 would be a required on the assumption that it is 100  
2 per cent disposal. We have approval to acquire that  
3 property.

4 MR. MORAN: Q. That was in the context  
5 of the original plan, though. We are now looking at an  
6 expanded plan.

7 MR. DAWSON: A. No, that was in the  
8 context of being able to install FGD on Lambton,  
9 Nanticoke and Lakeview. All units.

10 MR. MORAN: That's all I wanted to ask on  
11 that point.

12 FURTHER CROSS-EXAMINATION MS. MacDONALD:

13 Q. Just a couple of additional  
14 questions. It could be, Mr. Dawson, in your area.

15 We were just interested in Hydro's  
16 ongoing monitoring or assessing of other technologies.  
17 I will name of three of them. Pressurized fluidized  
18 bed combustion, and I know you have spoken of that;  
19 steam-injected gas turbine; inter-cooled steam  
20 injection gas turbine, and advanced fuel cells.

21 Now I know Mr. Moran spoke of the fuel  
22 cell development yesterday. But with respect to the  
23 first three, is Hydro monitoring the developments of  
24 these technologies at the present time?

25 MR. DAWSON: A. Well, in terms of

1       pressurized fluidized bed, yes, we are monitoring  
2       developments, we are keeping track of developments.  
3       We know of the three demonstrations that are currently  
4       going on at 80 megawatt scale.

5                       In terms of, I think you mentioned  
6       inter-cooled and steam-injected--

7                       Q.   Yes.

8                       A.   --gas turbines.  We are not doing  
9       very much with those.  They don't exist at the moment  
10      other than as concepts, but that doesn't mean that they  
11      won't develop, and as they do we will be keeping track  
12      of them.

13                      Q.   From your knowledge of those last two  
14      technologies, do you see any potential at all for those  
15      two?  We will realize that they were only at the design  
16      stage and early stages, but do you see any potential  
17      for those technologies?

18                      A.   I can see that inter-cooled gas  
19      turbine technology has some potential in that it will  
20      increase the pressure ratios that are available and  
21      therefore increase efficiencies of gas turbines.

22                      Steam injection is a way of essentially  
23      avoiding the capital investment in the steam turbine at  
24      the back end of a combined cycle, but you do it at the  
25      price of enormous evapourative loss, because all that

1 water is going up into the atmosphere rather than being  
2 recovered and recycled.

3 The estimates that I have seen don't in  
4 fact show a big improvement in cost over combined  
5 cycle, so I am a little dubious about it right now.

6 Q. About that particular technology.

7 One brief moment.

8 Thank you, panel. I think those are all  
9 my questions for now. We had hoped to take you right  
10 to one but... My colleague indicated that he does have  
11 a few questions.

12 Perhaps that wasn't phrased the best way.

13 MR. MORAN: Mr. Chairman, I have just one  
14 more area to cover briefly. I had some discussions  
15 with Mr. Howard earlier on and we have reached an  
16 agreement on a couple of points which means I don't  
17 have to take up anymore of the hearing time on some  
18 issues.

19 FURTHER CROSS-EXAMINATION BY MR. MORAN:

20 Q. The issue I want to cover now is a  
21 fueling issue, so I am going to address this to Mr.  
22 Smith and Mr. Meehan.

23 As I understand your evidence, one of the  
24 concerns you have about the gas option is the price,  
25 and the fact that perhaps the price may escalate quite



1 a bit over the long-term. I am wondering what  
2 consideration you have given to the role that IGCC  
3 potentially could play as providing a cap on natural  
4 gas prices given that IGCC relies on gas manufactured  
5 from coal, which, as you have indicated, is very cheap  
6 compared to gas. Have you done any analysis relating  
7 that?

8 MR. MEEHAN: A. I don't think we have  
9 done any analysis of that. But you are suggesting if  
10 all of the -- a large number of utilities were to think  
11 in terms of building IGCC, that might limit gas prices  
12 generally? Is that the idea?

13 Q. Or even within Ontario Hydro, if you  
14 were relying on a mix of technology including CTUs and  
15 CCs, as well as IGCCs, that would give you have  
16 flexibility and perhaps the ability to --

17 A. Certainly, this is the idea of what  
18 we call the phased IGC option, which I think is option  
19 8. We would build it first as just combustion turbine  
20 units, then if the price of gas increased somewhat we  
21 would go to a more efficient option which is a  
22 combined-cycle option, and then again if the price of  
23 gas were to increase even more, we could convert it to  
24 a coal gasification by adding a third phase to that  
25 project. That does give us a lot of flexibility. And

1 in our documents I believe we favour that technology  
2 somewhat. It's slightly more expensive than the  
3 conventional steam cycle, but we favour it because of  
4 its flexibility.

5 But again, we are not making that  
6 decision now, and things can change in the next few  
7 years, of course.

8 Q. Would you agree that if IGCC was  
9 actually in place as you have suggested in a variety of  
10 utilities, that you would really have a situation of  
11 gas from coal competing with natural gas and perhaps  
12 acting as a moderating influence on the price of  
13 natural gas.

14 A. That could. I think you are aware of  
15 what you are weighing off there. There is a high  
16 capital cost associated with the IGCC plant.

17 Q. In terms of IGCC, perhaps I can  
18 address this to you, Mr. Dawson. I understand it's in  
19 the late development stages.

20 Could you indicate briefly what hurdles  
21 you believe still have to be overcome from Hydro's  
22 point of view before IGCC would be a suitable  
23 technology to rely on?

24 MR. DAWSON: A. I think we probably want  
25 to develop some more confidence with respect to our own

1 specific coals and their performance in gasifiers,  
2 though coals typical of the Appalachian coals that we  
3 burn have been gasified in substantial quantities, so I  
4 don't think there is a question of the technical  
5 feasibility.

6 I think that the other area relates to  
7 integration of the gasifier with a combined-cycle and  
8 how best to do that. There are a number of approaches  
9 from building a combined cycle without taking any  
10 account of the fact that you may or may not put a  
11 gasifier on it, and you want the gasifier later and  
12 take your lumps, or you plan the initially to use  
13 gasification and you integrate it.

14 When I say integrate it, I am thinking  
15 about the heat recovery in the gasifier which generates  
16 steam and how do you incorporate that into the system.  
17 It's those sorts of issues that I think are the ones  
18 that need to be explored more.

19 Q. Are you able to give any opinion  
20 relating to a time frame?

21 A. Well, I think the development is -  
22 taking place a lot faster than our need for new  
23 generation right now. The Dutch are installing in the  
24 250 megawatt unit at Buggenhem. They are saying that  
25 they will immediately follow from there with a 600

1 megawatt unit. We are talking 2009, 2010.

2 So I think there is a lot of room for  
3 development work and a lot of things to happen in the  
4 meantime that will give us increased confidence in our  
5 ability to use the technology.

6 MR. MORAN: Thank you. Those are my  
7 questions.

8 Mr. Chairman, as I indicated, I did have  
9 a discussion with Mr. Howard earlier on. We have  
10 agreed on two things, I believe. The first is that  
11 Ontario Hydro's evidence in this panel has produced  
12 many facts and figures that are spread quite widely,  
13 and what I am proposing to do is ask to reserve an  
14 exhibit number and I tend to pull several parameters  
15 into a single table for convenience of reference, run  
16 it by Ontario Hydro to ensure accuracy, and then simply  
17 file it that way. Mr. Howard has indicated that he  
18 doesn't have any problem with that and perhaps you can  
19 confirm that.

20 MR. HOWARD: Yes, I readily agreed when  
21 my friend said he was contemplating getting it done in  
22 an hour's examination, so I agree.

23 MR. MORAN: I suggested to him that it  
24 would be faster to do it this way than perhaps by  
25 direct questioning the panel. So maybe I could reserve

1 an exhibit number than for that.

2 THE CHAIRMAN: Could we have an another  
3 exhibit number for that, please?

4 THE REGISTRAR: Yes. That will be 515,  
5 Mr. Chairman.

6 ---EXHIBIT NO. 515: (Reserved)

7 MR. MORAN: The other item that we  
8 discussed, Mr. Chairman, was with respect to a line of  
9 questioning that took place yesterday with Mr. Shalaby.  
10 He did what he suggested was an extremely rough  
11 calculation about the impact on rates on the assumption  
12 that one per cent of capacity was in the form of solar  
13 and in another scenario in the form of wind.

14 I suggested to Mr. Howard that perhaps  
15 they might be willing to do a more accurate calculation  
16 for each of the scenarios, as well as for the three  
17 ranges of estimates.

18 THE CHAIRMAN: You mean each of the six  
19 scenarios; is that what you mean?

20 MR. MORAN: For the solar option there  
21 are two scenarios and for the wind option there are two  
22 scenarios, and for each of those there are cost  
23 estimates, there is a point estimate and then there is  
24 an upper estimate and a lower estimate.

25 In discussions with both Mr. Shalaby and



1 with Mr. Howard, they thought that it would be useful  
2 to put together a slightly more accurate calculation  
3 and perhaps expand it to include the upper and lower  
4 estimates as well. Without going through a fancy  
5 modelling exercise, Mr. Shalaby indicated that it  
6 wouldn't be too difficult for him to do that.

7 MR. HOWARD: Yes, and without conceding  
8 to the usefulness, which my friend will argue, we will  
9 do it, but we don't concede by any means that the  
10 result will be useful to anybody.

11 MR. MORAN: We believe it will be useful  
12 to us at least and that's why we are asking for it.

13 In any event, perhaps we could make that  
14 into an undertaking.

15 THE CHAIRMAN: Could we have an  
16 undertaking number, please?

17 THE REGISTRAR: .33.

18 ---UNDERTAKING NO. 478.33: Ontario Hydro undertakes to  
19 provide the impact on rates on the  
20 assumption that one per cent of capacity  
21 was in the form of solar and in another  
22 scenario in the form of wind.

23 MR. MORAN: Ms. MacDonald advises me that  
24 she has a few questions left. I note that it is five  
25 to one.

26 THE CHAIRMAN: What do you mean by a few  
27 questions?

1 MR. MORAN: Perhaps I will let Ms.  
2 MacDonald answer that.  
3 [12:54 p.m.]

4 MS. MacDONALD: Thank you, Mr. Chairman.  
5 I realize this is an inopportune time to find  
6 additional questions, but they are mainly these: We do  
7 have some environmental concerns that I want an  
8 opportunity to review. It could be after that review  
9 that they will be very brief indeed, but I would  
10 appreciate an opportunity just to check that we have  
11 covered those.

12 THE CHAIRMAN: So what you are really  
13 saying is you would like the luncheon break to come  
14 back to check your notes to make sure you have covered  
15 everything.

16 MS. MacDONALD: Thank you, Mr. Chairman,  
17 that is it.

18 THE CHAIRMAN: It is a time-honoured  
19 luncheon device. You have run it up to lunch time and  
20 that is how you have done it. You have got a break.  
21 Okay, we will adjourn then until 2:30 this afternoon.

22 MS. MacDONALD: Thank you.

23 MR. MORAN: Thank you, Mr. Chairman.

24 THE REGISTRAR: We will adjourn then  
25 until 2:30.

1 ---Luncheon recess.

2 ---Whereupon the hearing was adjourned at 12:55 p.m.,  
3 to be reconvened on Monday, the 9th day of March,  
4 1992, at 10:00 a.m.









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